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THE FAR EASTERN REVIEW

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Engineering
Finance ❀ Commerce

Vol. XII., No. 10. ❀ SHANGHAI—MANILA ❀ March, 1916.

The Pingsiang Colliery

China's Railways in 1915

Collapse of Monarchy Movement

The Taiwan (Formosa) Exposition

Shanghai's Municipal Electric Plant

Hokkaido Timber Industry

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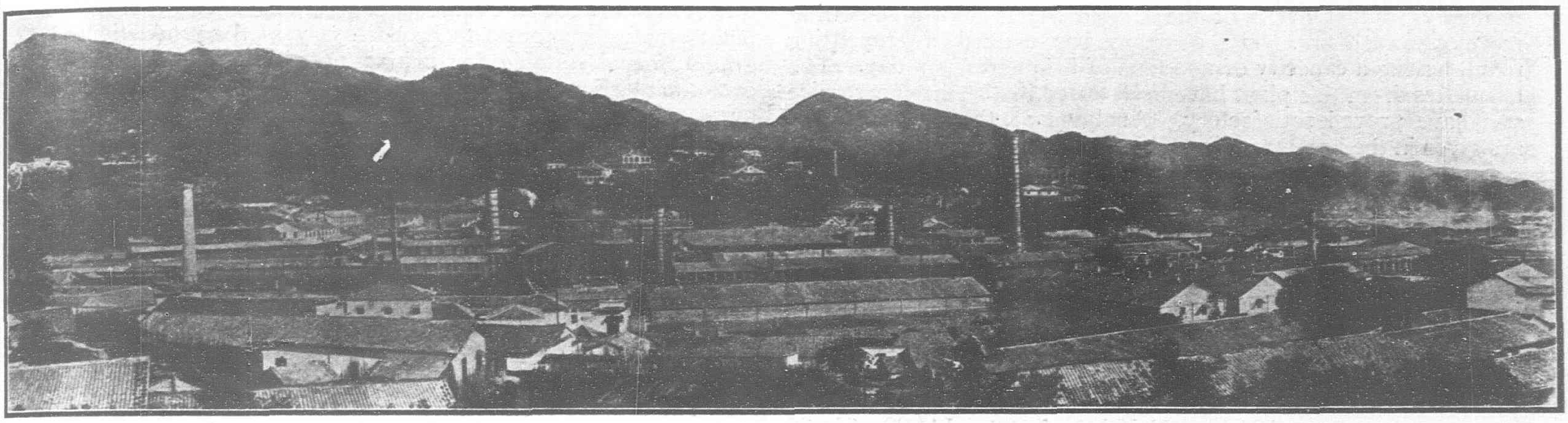
VOL. XII. SHANGHAI, MARCH, 1916 No. 10



PANORAMA OF THE PINGSIANG COLLIERY OF THE HAN-YEH-PING COAL AND IRON COMPANY

THE PINGSIANG COLLIERY

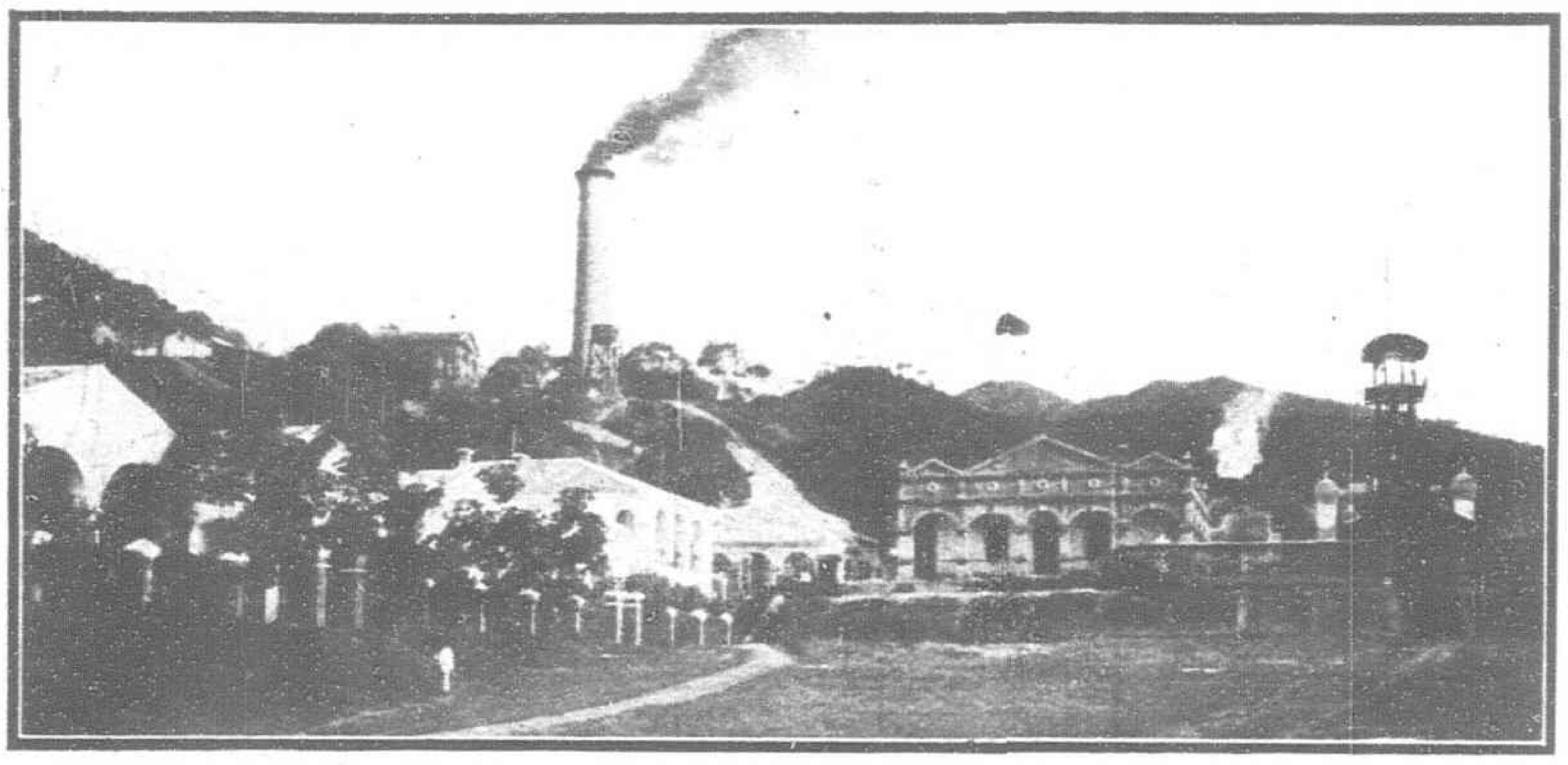
A Story of Early Mining Difficulties in China

The Pingsiang Colliery is situated in the Province of Kiangsi, close to the eastern border of the Province of Hunan. The locality has always been known to contain an immense quantity of coal, and the Chinese in the past dug into these deposits from the surface at points on the outcrops so far as their superstitions would permit. At this time of writing the viewpoint of the natives has been greatly expanded and fear of the earth dragon ascending from holes in the ground is no longer an excuse for backwardness in developing the mineral resources of the country. When the Pingsiang colliery was opened the trials and tribulations, were, however, constant and varied, as is recounted by Mr. Gustavus Leinung, the Manager. To open the mine some $3,000,000 were borrowed from Germany, but that loan has now been paid back and the property is entirely owned by the Han-Yeh-Ping Coal and Iron Company, though certain loans which were contracted after the Revolution of 1911-12 remain outstanding.

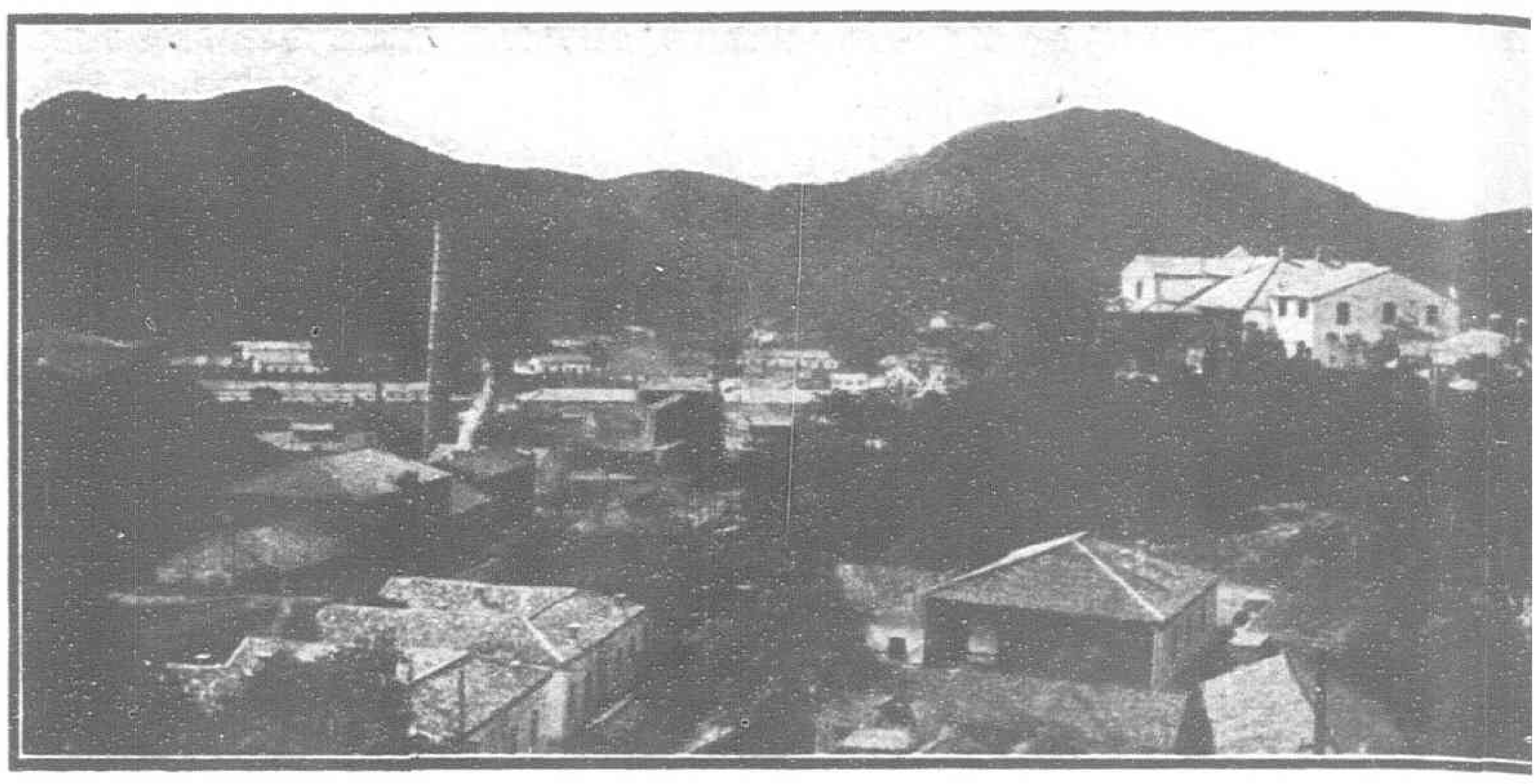
"It is a surprise to a stranger," writes Mr. K. P. Swensen, "to visit this mining camp. Riding over the railway from the Siang River to the mine, he is given a magnificent perspective of the typical Chinese landscape in a prosperous rice-growing section. From the mountain heights, irregular small ranges succeed each other into the valleys to blend with the foothills in a maze of terraced rice fields. One marvels at the thrift of the Chinese farmer and the intensive culture to which he is forced to resort. All this the traveller looks upon and wonders at the still crude methods of labor, when he suddenly finds himself thrust into the industrial city with its multitude of chimneys and substantial brick buildings, which have been built on such a modern scale by the Pingsiang Colliery Co. As the mine is in the heart of China, far from the source of machinery supplies and the like, it is necessary to keep complete repair shops as well as shops equipped to manufacture, as far as feasible, all necessary machines and appliances. This saves the time and expense incidental to ordering from abroad. There is a large round-house to accommodate the dozen or more locomotives and a large railway machine and repair shop. In the main machine shop are manufactured steam engines, compressors, pumps, lathes, and in fact almost everything in the heavy machinery line except electrical machinery. A foundry in connection turns out castings up to three tons weight.

CHANG SHOU-CHAN, THE COMPANY'S FIRST MANAGER

An important adjunct is a series of coke ovens along the railway tracks. These ovens are of the Otto-Koepe type, of which there are 300 in operation. Almost all the coke is supplied to the blast-furnaces of the Hanyang Iron & Steel Works at Hanyang. The coal used consists of the fine material saved from the washing plants and runs not over 10% ash and under 0.05% sulphur. In appearance the coke resembles that produced



Pingsiang Colliery—Head Frame for Main Shaft



General View of Pingsiang

in the by-product ovens of the United States with a somewhat more silvery lustre. The company has erected a briquetting plant, having a capacity of 200 tons of briquettes per day. The briquettes from this plant have been tested in the marine service and have proved satisfactory. Analyses of the coal and coke are given in the accompanying table:

Analyses of Pingsiang Coal and Coke

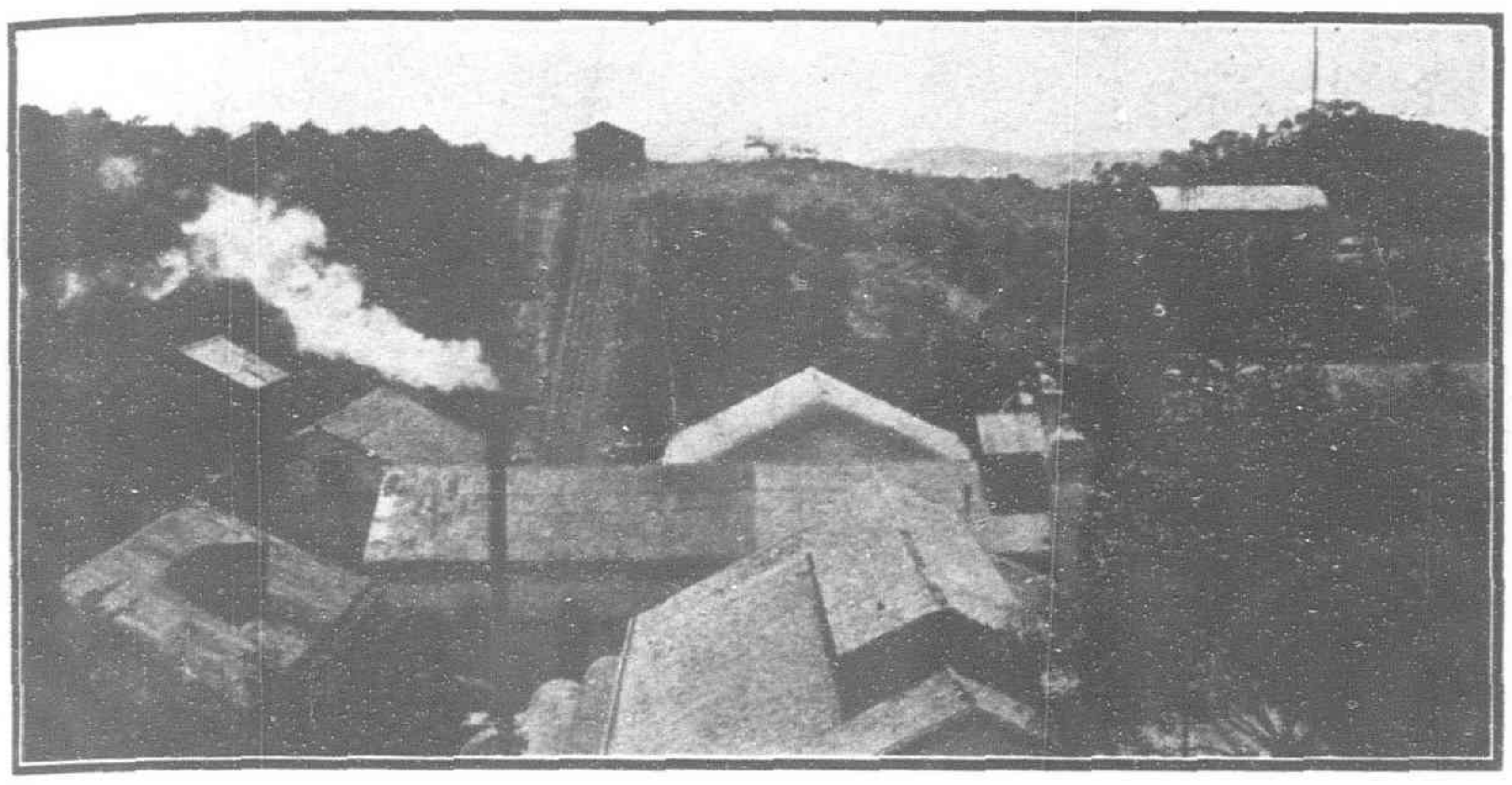
	Foundry Coke	Smelting Coke	Navy Coal	Washed Coal	Run-of-Mine Coal.
Analysis in the Crucible					
Fixed carbon	87.941	88.060	60.167	59.921	54.118
Volatile	——	——	30.290	24.240	23.490
Combined water	1.119	0.840	1.953	1.149	1.392
Ash	10.940	11.100	7.590	14.690	21.000
Elementary Analysis					
Carbon	83.520	84.252	79.239	75.330	70.758
Hydrogen	1.067	0.744	5.099	4.891	4.012
Sulphur	0.506	0.618	0.547	0.522	0.527
Oxygen	1.833	1.480	4.102	2.241	1.107
Nitrogen	1.015	0.966	1.470	1.169	1.204
Hygr. water	1.119	0.840	1.953	1.149	1.392
Ash	10.940	11.100	7.590	14.690	21.000
Analysis of the Ash					
Silica	62.040	60.820	49.040	60.520	65.700
Alumina	26.360	27.640	25.690	24.979	24.890
Oxide of iron	5.960	6.100	16.430	3.840	3.770
Lime	3.410	3.200	5.340	6.340	2.860
Magnesia	1.770	1.850	2.800	3.400	2.220
Melting Point of the Ash					
The ash melted at °C.	1350	1450	1200	1250	1355
Heating-Power and Evaporative Efficiency					
Capacity of heat (Cal.)	6977	6962	7690	7402	6815
Quantity of steam at 100°C. produced by 1 kg. of Pinghsiang coal from water at 0°C. (kg.)			12.07	11.62	10.69

The mine is opened by a principal adit 3000 metres in length, and by another short adit which connects with a main working-shaft 170 metres in depth, and a ventilating shaft 110 metres deep. The shafts are round in section, brick-lined, 4½ metres and 4 metres respectively in diameter. Recently a large Fraser & Chalmers hoisting engine with reel and flat rope has been installed preparatory to deep sinking. At the present time all the coal mined comes out through the adits. The beds are now being opened continuously downward and the shafts are to be increased in depth as required. In the main haulage ways trains of cars are drawn by electric locomotives of 10, 40, or 50 hp. each. These were the first electric locomotives used in China and were started in the year 1906.

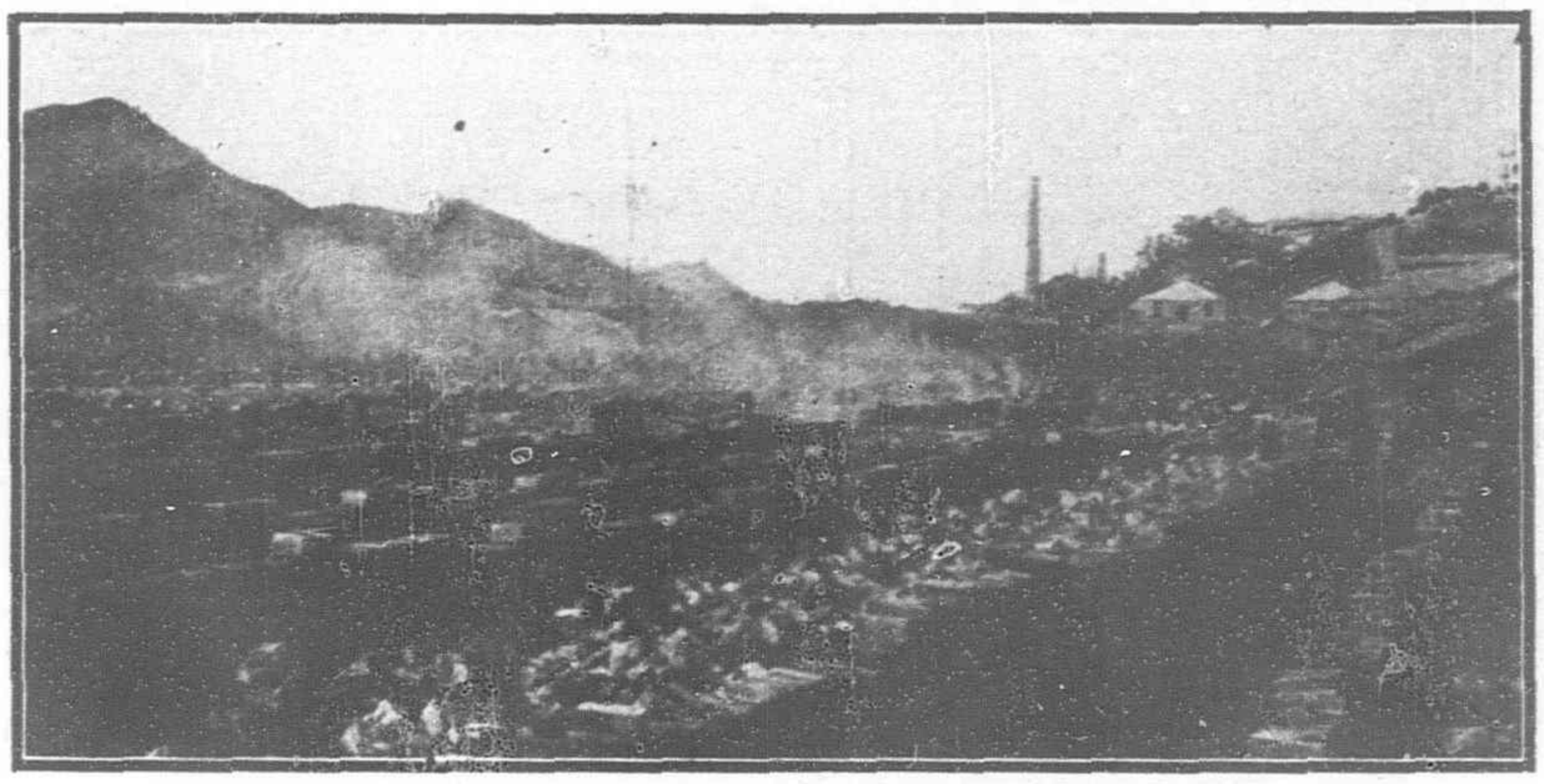
A feature of the surface operations is two coal-washing plants that were found to be necessary in the production of a grade of coal suitable for coking purposes. The coal is sent over shaking screens which give 4 sizes after the lump is run off over a 30 mm. screen. The material is then washed through a series of coarse to fine jigs, the light products of which all go to the coking ovens while the waste is discarded. This waste is given to independent Chinese coke manufacturers who re-wash the material by hand and turn out large quantities of good grade coke in simple rectangular ovens. This coke is sold for fuel. Fire-bricks of all grades and sizes are manufactured here and are of use especially for the coking plant and the furnaces in the steel works at Hanyang. A large amount is sent into the Oriental market and the demand for the brick is steadily increasing.

The country rock consists mostly of soft sandstone, and in the mine itself is found a hard limestone with many bands of slate and shale, as well as a large amount of soft clay partings in the coal seams. A great amount of development has been accomplished, and while the real life of the mine is largely conjectural, workable coal reserves have been developed to an extent that gives assurance of a supply that will last several hundred years with an output of 1,000,000 tons annually. The coal is bituminous, there being a hard and a soft variety. The hard coal is found in the smaller seams, those that are worked running from 15 to 75 centimetres in thickness. For the extraction of this coal it is necessary to take out a large amount of slate, most of which cannot be used for filling, but must be conveyed to the dump on the surface from the mouth of the mine. There are 8 inclined tracks running to the slate dumps which are already of immense size. Such a mine as this could not be worked profitably in the United States on account of the high percentage of slate since the labor cost and the cost of washing would be prohibitive. In China, however, miners are paid less than 13 cents gold per day, so that the labor cost is relatively low. There are three hard coal seams of large extent having a pitch of about 12 degrees, which are from 3 to 6 metres apart. They are mined by the ordinary long-wall method, in which the entries are run with the dip and along the strike and all the coal is extracted while advancing. This system of long-wall mining is also used in the soft coal seams, of which there are six. These seams vary in thickness from 3 to 12 metres. Drifts are run for the purpose of ventilation every 20 to 25 metres along the haulage-way and connection made about 70 metres distant from the main gangways to provide the air circulation. In the thickest seams blocks are removed to 3 metres in thickness, and, while the roof is supported with props, the open space is filled with waste and the second cut proceeded with.

The greatest difficulty is found in the maintenance of haulage and passage-ways, because of the tremendous pressure. This makes timbering an expensive item, for the timbers must be constantly replaced. No attempt is made to relieve the pressure on the main timbers by providing auxiliary sets as is sometimes done for swelling ground in America. The roof is allowed to fall until it becomes low enough to interfere with the workmen, when it is cut down and new sets put in. This happens as often as once every four months in certain parts of the mine. The main haulage-way is lined with brick with an



Pingsiang Colliery—Vertical Shaft and Slate Dump



Pingsiang Colliery—Chinese Coke Ovens

arched roof where the pressure is greatest. At other places the roof is supported by steel rails and lagging with brick walls. In the endeavor to maintain permanent haulage-ways where the pressure is great, as many as 10 courses of brick have been used in the arches and in many cases these have failed and crumpled under the pressure. This is the only way the engineers have of ascertaining the relative pressure although such trials are very expensive. In the matter of handling the labor, the management has found it an advantage to let out the greater part of the work by contract to Chinese foremen. It is a policy that is found to be particularly successful with the Chinese. They must be driven to doing right and habitually disobey orders unless constantly watched. The mining of the coal is done at a stipulated price per ton, varying with the conditions of mining, and the contractor must guarantee a minimum of 10 to 12% ash, before his output is accepted. Timbering and tunneling is done at an agreed price per metre. The coal and coke are dumped into steel cars and conveyed over standard track to the port of Chu Chow at which point, along the river, are lined up steel and wood lighters, with barges and junks of various description. These are towed to Hankow by the company's tug-boats in lots of about 1200 tons. The handling of the coal affords an instance of how necessary it is to adopt methods to suit conditions in a strange country. There is no need for the use of large capacity automatic-loading devices such as are used in America, for in China labor costs but about one-twentieth of what it does in America. The coal, after being dumped on the ground along the track in great piles, is conveyed by coolies who use carrying-poles with baskets attached, holding perhaps a bushel each. There are several hundred of these men constantly at work moving from 1800 to 2000 tons of coal and coke per day from the railroad into the barges.

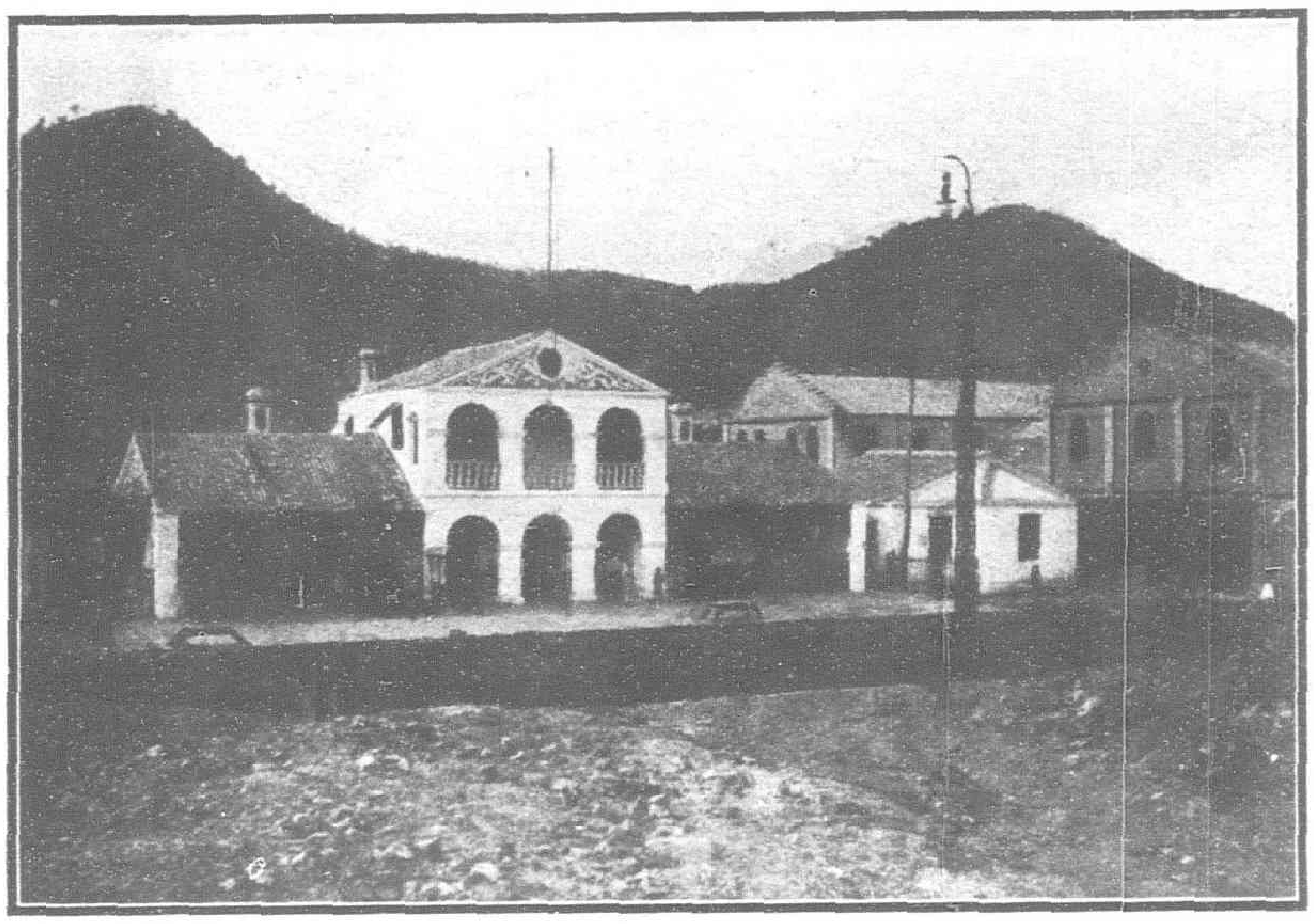
Transportation is handicapped during the winter season because of low water in the upper Siang River. This difficulty will be eliminated as soon as the railroad now under construction is built. A feature of the Pingsiang Colliery Co.'s operations is the growth and progress, these being evident in the output, in the resultant enlargement and improvement of the plant. The engineers and managers endeavor to turn out highgrade products. The success of the company furnishes an example for future undertakings and gives an insight into what may be expected from the eventual development of China's immense mineral and coal deposits."

The Early Difficulties

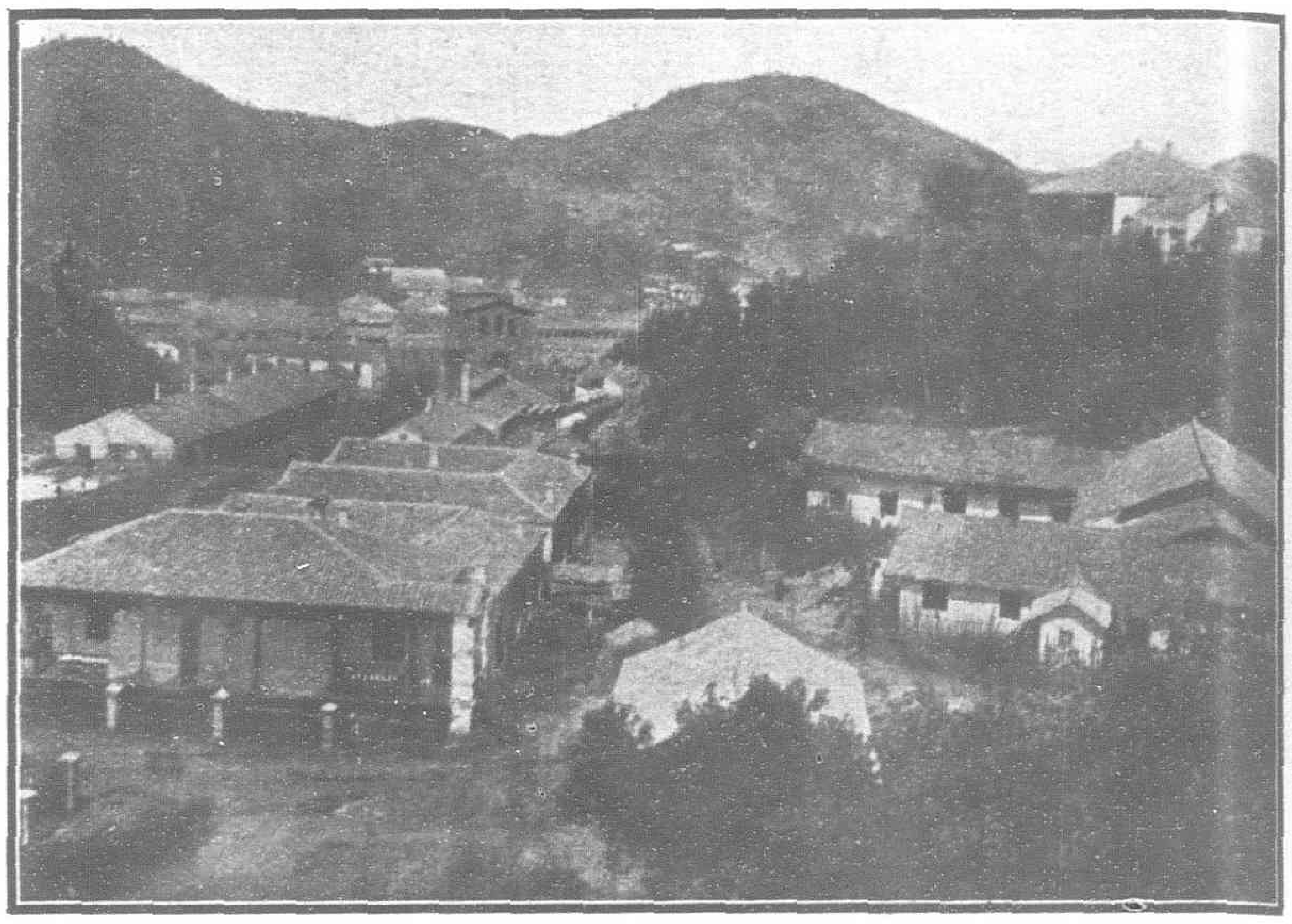
An interesting history of the mine has been furnished us by Mr. Leinung. He first went up to Pingsiang in 1896 for preliminary investigations, but it was not until 1898 that the mining operations really started. Mr. Leinung was alone for the first two years and had to do the geological, survey, planning and architectural work. Upon his first arrival at Pingsiang he was an object of awe and amazement to the natives who had never seen a European. All sorts of beliefs were held about him. He was said to have three eyes, one at the back of his head, and it was believed that he could see deep into the bowels of the earth and detect the treasures there. When he entered Pingsiang for the first time in 1896 the natives were sitting on the roofs of houses to see him. He was put into a small room in an ancestral hall in which there was a grated window, and the people were allowed to come along in squads of 10 or 12 to have a look at him, as though he were a rare zoological specimen. The idea was to make them accustomed to the appearance of a foreigner. During the first year there were always 200 soldiers around Mr. Leinung. He was not allowed to leave his quarters and had strictly to obey orders. At this time there was very strong anti-foreign feeling in Hunan and he had to journey to Pingsiang via Nanchangfu and Kiukiang as Hunan was forbidden to foreigners. Two years later he had to leave owing to riots and murders of missionaries.

When Mr. Leinung journeyed to Pingsiang through Hunan in 1900 the windows of his house boat were shrouded with blinds as he passed Changsha so that no one could see that there was a "foreign devil" within. He had a very exciting time for the first year, with the strong anti-foreign sentiment prevailing all round him. On one occasion one of his servants came to him with a placard which had been pasted up outside his house urging the people to kill the foreigner and all the Chinese with him at Pingsiang, and the servants, not unnaturally, became very frightened.

At first he employed men from Luyang as miners, then men from Hunan, and eventually men from the Tayeh iron ore mines; men whom he knew. In each case, however, the result was unsatisfactory. The local men were opium smokers and did not want to work regular hours. The men from Luyang were a disorderly, lawless lot, and those from Tayeh thought that they could draw their pay without working. Very often Mr. Leinung was almost despairing and felt inclined to drop the attempt to open up the mine. For the first six months he had depended upon his interpreter, but the latter had failed to handle the men properly. In the meantime Mr. Leinung had learnt a little Chinese and he determined to put the interpreter on one side and negotiate himself with the better men whom he had picked out. He asked these men to work by contract which they refused to do before, preferring payment by the day. Mr. Leinung took the most reasonable of the men aside and showed them that they could make more money by working by contract. They agreed, and gradually he succeeded in making a start on this basis. In the beginning he followed the invariable practice in China and took a compradore to manage all the details. The unfortunate result was that as the work grew greater and the number of miners larger the compradore could not personally superintend his men and get the proper amount of work out of them. The contracts which Mr. Leinung made with the contractor or compradore were drawn up on similar lines to those with which Mr. Leinung was familiar in his own country, but the contractor had engaged his men on daily wages and could not supervise their work properly. The result was that he began to lose money and Mr. Leinung had to point out to him that it was impossible for him (Mr. Leinung) to pay more than was named in the contract. The contractor got deeper and deeper into debt with his men. It was now approaching Chinese New Year, when, as is generally known, all Chinese are supposed to pay off their debts. The miners insisted upon the contractor paying them, but as he had no money he told them that the fault was with the foreigner who did not pay him enough money. Then came the first strike at the Colliery. The men beleaguered Mr. Leinung's house and



PINGSIANG COLLIERY—RAILWAY STATION AND THE WORKS YARD



PINGSIANG COLLIERY—HOSPITAL AND OFFICE BUILDINGS

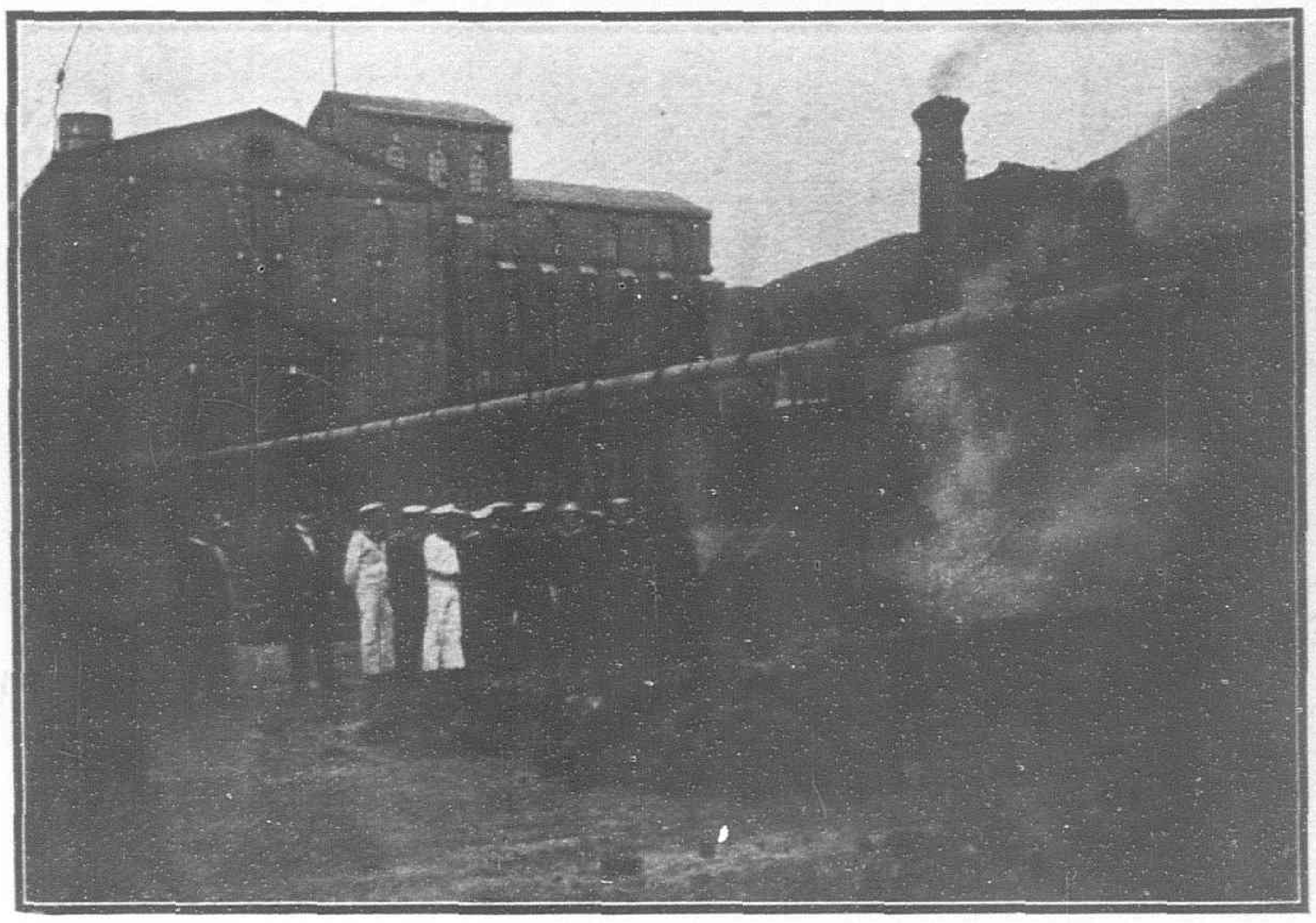
demanded money, which of course he refused to pay. That strike lasted for three days. Mr. Leinung took advantage of it to break the power of the contractor, because he saw that it would not be advantageous to do the work through a single contractor. He decided that it would be better to have individual contracting parties at the different working places.

At this time he had about 200 miners and about 20 working places, most of which, of course, the contractor could not superintend, not being an experienced miner. At that time with so small a body of men Mr. Leinung knew almost every one individually and knew their capabilities—good and bad. He took the opportunity to persuade the workmen that it would be to their interest to take contracts for a single working place by themselves. He offered them in the last moon of the year for that month such contracts that they could earn as much in one month as the contractor would pay them in four or five months. Mr. Leinung wanted to gain his point and that was what dictated this offer. Many of the better miners were allured at the prospect of earning so much money and consented to take the individual contracts. On the third day he got all of the men who had accepted the contracts into his office, made them an advance payment and had the necessary tools delivered to them. Mr. Leinung and his assistant were in the office at 9 o'clock making the final arrangements with the miners and just when he thought that everything was satisfactorily arranged some miners came in with bleeding heads. These were some of the men with whom he had already settled the individual contracts and who had gone to work. These men kowtowed and asked to be excused for not going on with the contract as they would be killed by the other miners if they did. Mr. Leinung decided upon quick action and told his interpreter to tell the soldiers to arrest the men who had attacked the contractors. The soldiers refused to venture among the crowd, being afraid. That made Mr. Leinung more furious and he declared that if the soldiers would not go he would go himself. He was warned not to do so as the people were in an ugly mood and he would only endanger his life. He insisted upon going and armed only with a strong miner's oak stick and accompanied by the assistant engineer he set off for the men's quarters. Some soldiers followed. When he reached the men's quarters he was saluted by yells and threats and the position was anything but pleasant. But knowing that if he showed any fear he was lost he summoned up all his courage and went right up to the mob and, taking an elevated position, began to address them in as good Chinese as he could command. He knew enough to make them understand. In his address he pointed out that after he had made satisfactory arrangements with the men who really wanted to work some mischief-makers had attacked the men and threatened others who wished to work. Moreover, he told them, the contractor had not been able to pay them because he was not able to get them to do the amount of work corresponding to the daily wage he agreed to give them. He had himself been a miner and they could not fool him. The contracts given to the contractor were fair and the amount of work could be done. They were similar to contracts in foreign countries where the miners made from $ 1.50 to $ 2.50 per day. The contractor had made nothing out of the contracts, but had lost money and was unable to pay them simply because of their own laziness. He again offered them individual contracts which would enable them in one month to make up all the money the contractor owed them. At 6 o'clock the following day he would go to the mine and he expected to see them in their working places and then final arrangements would be made.

When Mr. Leinung finished his speech there was shouting from some quarters, and demands that before there were further negotiations he should pay over the money owing by the contractor. He knew the men who called out as a lazy lot of useless fellows who had always been an encumbrance. Accordingly he caught hold of the one nearest by the queue, made the others—about six in number—come and stand beside them. Then he told them flatly that they were a set of useless rascals and that his offers were not for them. He had no use for them and told them that they had to clear out. He ridiculed them, and the other Chinese, who knew that Mr. Leinung had judged fairly about the capacity and character of these men, began to laugh at them, and the victory was practically won. The next morning he found the men in the working places and by noon had everything settled and could leave the mine.

A new start was made the following day with satisfactory results. Everything went well for about a year, the men making good wages. The mine grew bigger and a much larger number of men were employed. By the time Chinese New Year came round the gang leaders had gradually developed into contractors, who ceased to work themselves but fed and housed the men and "squeezed" them. These gang leaders only visited the mine on the first of the month to make contracts and on the fifteenth, pay day, when they appeared in gorgeous silk attire, being carried from Pingsiang city in sedan chairs. The rest of the month they spent enjoying themselves in the city, letting the men work for them. This did not please Mr. Leinung at all and he realized that he now had to break the power of these contractors. The only way in which the power of the contractors over their men could be broken was by quartering the miners in houses belonging to the mine and feeding them at the cost of the mine. In the first place, therefore, huge mining quarters with kitchens and stores had to be built. Then the individual control and payment of the miners had to be provided for. The quarters were almost completed by the next Chinese New Year and the miners were informed that every one should get his pay according to the work done, and that no man would have the right to squeeze other men. Early in the New Year he received a written protest from the 63 gang leaders in which they told him that all the miners protested against the innovation as they were afraid that they would not get proper quarters and good food. Several hundred of the miners, the protest declared, would go on strike

PINGSIANG COLLIERY—MAJOR BOWLEY, UNITED STATES MILITARY ATTACHE, AND MANAGER LEINUNG (IN WHITE) AFTER A VISIT OF INSPECTION



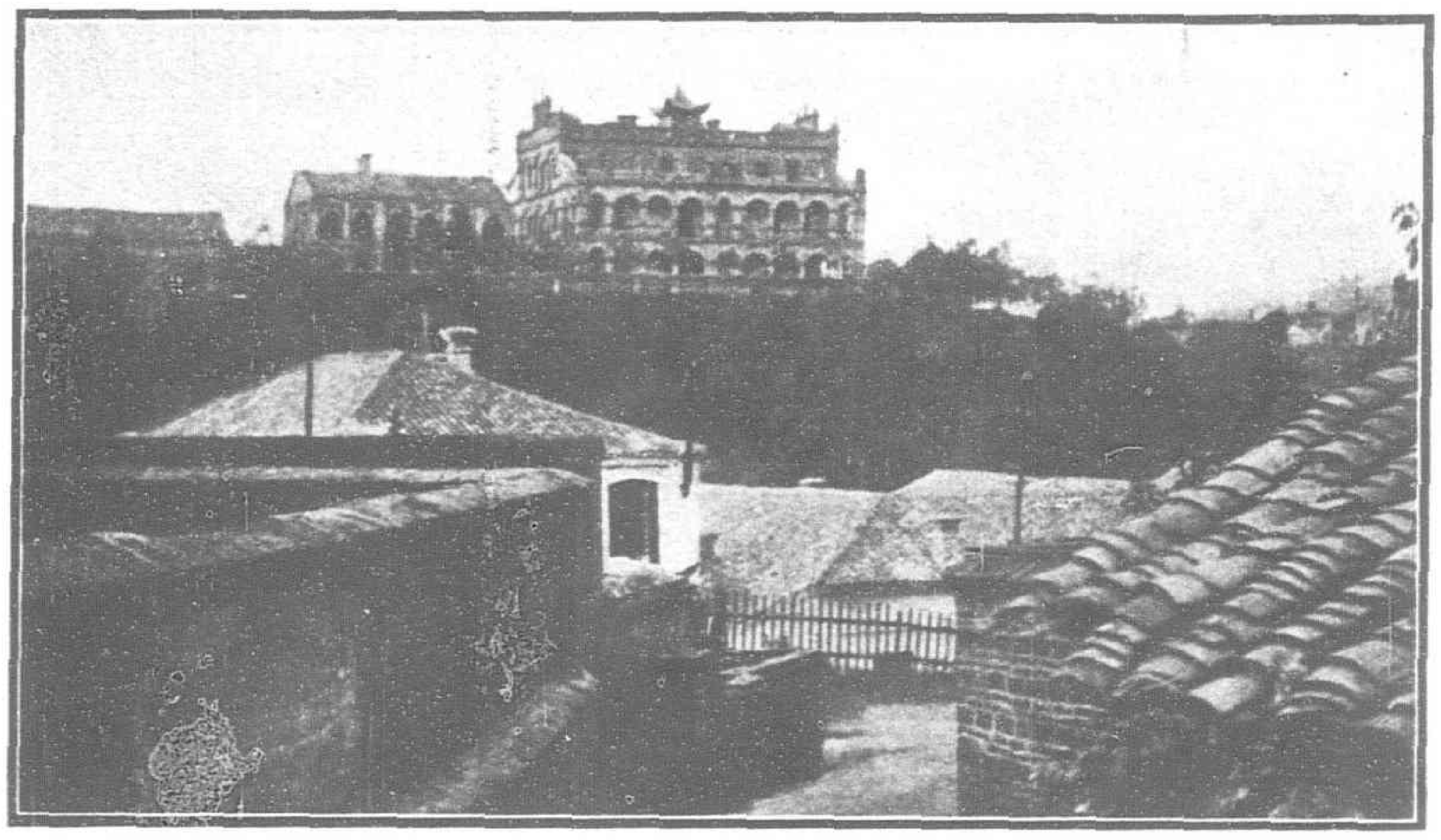
PINGSIANG COLLIERY—COOLING COKE FROM THE OVENS

if this innovation was to be made. As Mr. Leinung had built the quarters and had made all preparations for feeding the men he was naturally very angry at this opposition. As a matter of fact he knew that the greater proportion of the miners welcomed the innovation and were rejoiced at the prospect of being no longer squeezed by the gang leaders. It became necessary to find out who were the ringleaders in connection with the protest and to make an example of them. Early in the month when work was commenced he went from gang to gang finding out the men who had instigated the protest. One man who was charged with being a ringleader became frightened and said that he was compelled to sign the protest, although he did not wish to do so. It leaked out that on the fifth day of the New Year the miners had been assembled at a temple near by and that one of the gang leaders had addressed them telling them that the proposed innovation was against their interests and that they should combine to protest against it. The usual thing happened; the crowd went with the agitators and the aid of a *literati* had been invoked to draw up the protest. They all swore not to betray each other.

Mr. Leinung asked the men at the head of each gang whether they would work under the new system and they all agreed to do so if the others did. After three days the list of men who had thus agreed included most of the gangs working in the mine. Then Mr. Leinung went to the man whom he had all along suspected to be the ringleader, paid him off and told him to leave at once. The next month the miners' quarters were ready and the innovation was made without a hitch. The miners liked it immensely.

All went well for another year, but the number of miners and the output steadily increased and the cupidity of the miners was again stirred. They began to pay no attention to the quality of the stuff mined and expected to be paid for anything they sent out. There was constant trouble about this, and it became evident that something would have to be done. Mr. Leinung went to Europe about this time with Dr. V. H. Lee to assist him in matters connected with the Hanyang Iron Works, and during his six months' absence things had to be left to the assistant engineer, who had no knowledge of how to deal with Chinese. Before leaving, however, Mr. Leinung gave him full instructions that all coal that came out of the mine should be taken to an assembly station. He had this arranged so that on his return the assembling of the coal could be started. Some of the seams are pure while the miners turned out stuff with 45 per cent. of ashes as coal and the coal washeries were not sufficient to deal with it. During Mr. Leinung's absence conditions became worse among the miners. Soon after his return from Europe the contracts were fixed at so much per ton or per truck for coal containing a reasonable average percentage of ashes and for every one per cent more ashes one or more cents was to be deducted from the contract price per unit. He had proved to the men that they could turn out stuff with not more than 20 per cent. of ashes and had told them that he would give 20 cents per truck and deduct 1 cent for every one per cent. more than 20 per cent. of ash so that if there were 40 per cent. of ash they would get nothing. During Mr. Leinung's absence the engineer in charge does not appear to have handled matters very judiciously and he was dismissed immediately after Mr. Leinung's return from Europe. This meant that he had an assistant new to the place and conditions, when this rule was introduced. The new man was eager and energetic and anxious to show his ability. The first month the new rule came into force Mr. Leinung was called to Shanghai, so that he was absent when the payments for the month had to be made to the miners. Now the miners had ignored the rule and had continued to produce dirty coal, with the result that when pay-day came they had no wages to draw. There were about 2,000 miners employed at this time. Not unnaturally when they were told that they had earned nothing they were very discontented. The new man handled the situation injudiciously and the miners became enraged. They sent a deputation to his house and they complained that if they got no money they could not live or send money to their families. This discussion took place outside the engineer's house and he became frightened at their attitude and went inside. Stones were thrown and this was the signal for a general attack on the houses of the foreigners. Windows and furniture were smashed, and the situation became serious. The acting Chinese mine manager, the mine manager being absent, gave orders that the engineers should escape to the railway station where a locomotive was ready to take them to Liling, the then terminus. This they succeeded in doing, and in the meantime a telegram was sent to Mr. Leinung telling him of the disturbances at the mine. He was very anxious for the safety of his men and asked his Consul-General what to do. The despatch of a gun-boat was suggested, but this idea was not adopted and Mr. Leinung himself started to return to the mine. In the meantime the old manager had returned. Being a sagacious man he succeeded in appeasing the miners, and the engineers who had fled were able to return to the mine before Mr. Leinung arrived. None of them, however, was allowed to enter the mine before he came. When he arrived he told the men that it was not his intention not to give them any money, but they must understand that coal and not stone was wanted. He would prove to them by taking samples at each of the working places that it was possible to produce clean coal. As Mr. Leinung had great influence with the miners and was looked upon as the "Father of the Mine" the men acknowledged the force of what he said and a compromise was arrived at. It was not, however, safe to let the other foreigners go into the mine for several days. The men were treated more leniently on the next pay-day, and they gradually became accustomed to the new rule and the percentage of ash was reduced from 40 per cent to 20 per cent.

One great mistake had been made whilst Mr. Leinung was away in Europe and that was allowing too many miners



Pingsiang Colliery—Administration Building

Pingsiang Colliery—Loading Coal from Cars to Barges

to be employed in the mine and also allowing eight hour instead of twelve hour shifts. It became necessary to rectify the hours of the shifts in order to get more work out of the men, and also to reduce the number of miners. The amount of work done per head was less than one-fifth of what foreign miners could do. Mr. Leinung was convinced that he would get much more work out of the men if he reverted to the twelve hour shift and reduced the number of men. This was in the year 1906. The men were quite satisfied to revert to the 12 hour shift, which had been the original system. In June, 1906, the 12 hour shift system was reintroduced. This was the time of the great floods in Hunan, when the water was up to the roofs of the houses in Changsha. It rained from October, 1905, to June, 1906, and the water in the mine greatly increased. Sufficient provision in the way of pumping plant had not been made, but what pumps there were kept working night and day. No time could be spared for any repairs to the pumps and there was a constant danger of a breakdown.

On the evening of June 10, 1906, when Mr. Leinung was at dinner the engineer in charge of the mine pumps came in and declared that the mine was lost as two pumps on the lowest level had broken down and it was impossible to get them repaired. After many days of ceaseless toil the danger was averted, but on pay-day a big strike among the miners who objected to the reversion to the twelve hour shift and to the dismissal of some 500 miners, was announced, and which lasted for three days during which time of tension a locomotive with an empty car was in readiness for the foreigners to make a start at any time.

On the fourth day work was resumed. The miners had consented to go back to the 12 hour shifts, but the foreigners were warned that if they attempted to introduce any other innovations all the miners would go on strike. Everything went on smoothly for the next few months, but in November troubles broke out in the neighbourhood and a revolution was apprehended in the country north of Pingsiang city. That was at the time of the Triads rebellion. Placards were posted on the walls of Liling and Pingsiang calling upon every one to rebel against the Manchu Government and every day decapitation of suspects took place at Liling and Pingsiang. Rumours were spread at that time to the effect that foreigners were getting the eyes of Chinese children to use as medicine. On the night of December 7 all foreigners were urged to leave that night. A locomotive and car were waiting at the station. The rebels had already taken a place about 90 li distant and were then on the march for Pingsiang city. The path they would follow lay for the last 30 li from Siangtung along the railway line, and it was to be feared that they would burn the timber bridge at Siangtung. A little after 2 a.m. they started, expecting to find the bridge at Siangtung in flames, or to meet the rebels on the way. The foreigners carried rifles for their defence, if necessary. The necessity fortunately did not arise, and they got safely to Changsha, where the party stayed for a month on house boats. During this month they received word from time to time from the colliery that the manager had taken energetic steps to secure peace and that soldiers had arrived from Changsha and Wuchang. Military law was prevailing at Pingsiang and decapitations were going on by the dozens day by day.

About January 5 they started back to the mines, and on arrival found that only 300 out of 2,000 miners were left though actually the mine itself had suffered no damage except the interruption of output. Work was resumed with a better class of miners and the undesirables had been got rid of by this disturbance.

From this time there was steady progress at the mine, and the number of men and output grew bigger and bigger as the men grew more experienced under foreign training. Nothing happened to interfere with the normal course of events until the revolution of 1911. This of course brought the foreigners into a critical position. They had heard of the rebellion at Wuchang and all sorts of rumours were afloat. They did not know what had become of the foreigners at Hankow. Then they heard that the disturbance had spread to Changsha and on October 22 at 9 p.m. the foreigners were warned that as Changsha was in the hands of the revolutionaries and no one knew what might happen to foreigners they must leave. They left at 3 a.m. and on the morning of October 24 they arrived at Hankow.

The affairs of the company were naturally in great confusion. Sheng Kung-pao had been cashiered and had escaped from Peking to Tsingtao; the Hanyang works were stopped on account of the fighting and all the tugs and lighters had been seized by the revolutionaries. There were no funds in hand. A temporary office was opened in Shanghai, all the miners were paid off, only the officials and a sufficient number of men to keep the mine in order being retained. The output, of course, was stopped entirely and only the main galleries were kept in repair. It was only due to the help given by Japanese capital that the mine was saved in this way. No other foreign capital could be obtained at that time. After having settled matters satisfactorily at Pingsiang the Chinese manager went to Shanghai and after consultation it was decided to discharge all the foreign engineers of the Hanyehping Works and the colliery, and most of the foreigners left for Germany in January, 1912. Mr. Leinung remained in Shanghai to watch developments, and later received telegraphic instructions to re-engage only five of his former assistants instead of twelve as had been arranged, on account of fresh troubles having arisen at Pingsiang. The natives in the vicinity of the mines had encroached upon the Company's property. They had opened a good many native mines in the Company's coalfield, although the first Chinese manager had taken great pains to buy out all the native mines within the field in the first years, and everything was in confusion as a result of the revolution, none of the former rights obtained from the Manchu Government being recognised. Every province wanted to be independent of the Central Government and in such conditions it seemed very doubtful whether it would be worth while resuming work at the colliery. However, at the beginning of April, 1913, they were able to return and to start work. It took some time to get the mine in order again, but this was done at last, and at present the output is about 3,000 tons per day.

COLLAPSE OF THE MONARCHY MOVEMENT

Presidential Mandate Restores the Republic

The Far Eastern Review has published each month in its columns as a categorical record the developments in connexion with the attempt to restore a monarchy in China. All important documents in the case will be found in previous issues. The following continues the story.

The issue of the Mandate postponing for an indefinite period the enthronement ceremony (reported in the last issue of the REVIEW) was variously interpreted. In some quarters it was believed—and the beliefs have proved correct—that it foreshadowed the eventual abandonment of the attempt to restore the monarchical system, while in others it was held that the system had already been restored and that the postponement of what after all is only a ceremony involved no change of plan.

A most important sitting of the Tsan Cheng Yuan was held on February 26 to consider a proposal to accelerate the convocation of the National Assembly. The representative of the Government, Mr. Chang Ming-chen, in introducing a Bill providing for an earlier meeting of the National Assembly than was originally intended, explained that the Government was anxious that the system of constitutional government should be instituted with the least possible delay. The idea was to make the members elected to the National Convention, members of the National Assembly, as the electorates and electoral methods in each case were practically identical. The proposals of the Government were agreed to and the following dispatch was sent to the State Department:—

> "In tendering this reply, the Tsan Cheng Yuan, acting in the capacity of the Li Fa Yuan, has the honour to acknowledge the receipt on the 25th inst. of the following mandate:—
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> "A Li Fa Yuan composed of members elected by the people ought to have been convened during the period of the Constitutional Compact. The need of such an organ is doubly urgent during this time when the Throne intends to start anew with the people. A Mandate was issued last year in the 12th month stating that the legislative organ would be established within a year. The desire of the people to see an efficient government at work is more earnest than ever, and in view of the need to respect the wish of the people and to reform the administration, the delay must not continue. The process of election for the Li Fa Yuan, however, is exceedingly complicated and difficult, and it is impossible to expect the same to be carried through in a short space of time. In these circumstances, it would be more practicable to treat the final election of the Citizens' Convention—already carried through in the provinces and all the special administrative areas in advance of the date fixed last year—as the final election for the Li Fa Yuan. In pursuance of this policy the successful and reserve members of the final election of the Citizens' Convention shall be regarded as having been elected to the Li Fa Yuan. The single balloting of the Special Central Electorate and the Combined Electorate of Mongolia, Tibet and Tsinghai, which have not yet been completed, shall be held at an early date for the purpose of electing members to the Li Fa Yuan. In this way the Legislature representing the wish of the people may be convoked within a short time. Whether this be practicable or not it is our duty to consult the acting Li Fa Yuan, which shall give us an early reply.'
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> "The State Department, in compliance with the instructions from the Throne, urged that this House should quickly deliberate on the question and submit an answer at an early date. In compliance with the order a meeting has been called and held on the 26th inst., and the House is unanimously of the opinion that since the procedure for electing the members of the Li Fa Yuan is identical with that for the election of members for the Citizens' Convention and since the people are eager for an efficient administration and the Government, at the beginning of the era of a constitutional government, is desirous of having the Li Fa Yuan established at an early date, the successful candidates of the final election of the Citizens' Convention should be regarded as successful candidates of the final election of the Li Fa Yuan, and the election of the Special Central Electorate and of the Combined Electorate of Mongolia, Tibet and Tsinghai should be abridged to an earlier date for the election of their proportion of members to the Li Fa Yuan. In proceeding in this manner the law will not be violated in the least. A perusal of the organisation law of the Li Fa Yuan shows that its regular session should begin on the 1st day of the 9th month and continue until the end of the year. At this time when the cause of constitutional government is advancing vigorously, the convocation of the Li Fa Yuan should take place at an earlier date than previously fixed so that the Legislature may soon be established and the expectations of the people may be satisfied and the foundation of the nation consolidated. The question has been discussed and unanimously settled in the sense of the proposal submitted. We have the honour to communicate this reply respecting our decision and ask the State Department to submit the same to the Throne for promulgation.
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> "Dated the 26th day of the 2nd month of the first year of *Hung Hsien.*"

This was followed by the promulgation on February 28 of the following Mandate:—

> According to the organisation law of the Li Fa Yuan, the beginning of the regular sessions of that body is fixed for the 1st of the 9th month and to continue until the end of the current year. But the opening sessions of the Li Fa Yuan differ somewhat from what will be its ordinary sessions. At this moment when the constitutional movement is being pressed with the utmost vigour, the Yuan should be convened at an earlier date than that prescribed in order that the longings of the people may be satisfied. It is hereby proclaimed that the first day of the 5th month is fixed as the day on which the Li Fa Yuan shall be convened. The Ministry of Interior and the Bureau for the Preparation of the Li Fa Yuan shall make all the necessary preparations to this end in accordance with law.
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> Since the past year we have, in absolute sincerity, declared to our citizens that the establishment of a constitutional government will be effected with the utmost despatch. Although it is highly important for a constitutional country to have a responsible administration to carry out great policies for the benefit of the country and secure blessings for the people, in addition to the Judiciary which must be organised in accordance with law, it is doubly important that there should exist a Legislature, collectively representing the wish of the people for the purpose of strengthening the far-sighted policy of securing a permanently peaceful and efficient Government. As a result of the Constitutional Compact—which invested the power of national legislation in the Li Fa Yuan to be composed of members elected by the people—the Bureau for the Preparation of the Li Fa Yuan was organised after the promulgation of the Organisation Law and the Election Law for the Li Fa Yuan, in order to attend to the necessary measures and arrangements required by law for an early establishment of the Legislature. Later, the Provisional Constitution Conference adopted a Bill for the organisation of the Citizens' Convention, which was promulgated according to the process of law. The organisation of the Citizens' Convention, with the exception of the sixty members elected by the legislating, administrative and judicial organs, is similar to that of the Li Fa Yuan respecting at once the number of members, the division of electoral areas, the qualifications for the electors and the procedure of election. And as the elections of these two bodies and their respective functions are practically alike, a Bureau for the Preparation of the Citizens' Convention was attached to the Bureau for the Preparation for the Li Fa Yuan, in accordance with law so that the two classes of affairs might proceed at the same time without causing confusion.
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> Since the establishment of these two Bureaux, repeated instructions have been given to the same speedily to complete, with the co-operation of the Superintendents of Election, the various stages in the process of organisation, including the investigation and drawing up of the lists of electors and candidates, the verification of electoral qualifications, etc., etc. In the ordinary course, the election for the Li Fa Yuan should first be held; but as the process of constitution making had already been begun by the nomination of a Committee by the Tsan Cheng Yuan to draft the same, it became necessary to change the date for the convocation of the Citizens' Convention to one earlier than that originally fixed. Consequently the election for the Li Fa Yuan, which was to have preceded the other, was utilised for the election to the Citizens' Convention. In this way, the election for the Citizens' Convention was begun after the 10th month of last year, and by the 12th month of the same year all the members of the Citizens' Convention, with the exception of those of the Central Special Electorate and the Combined Electorate of Mongolia, Tibet and Tsinghai—the elections of which have not yet been held—were elected as the result of the final elections held in the various provinces and special Administrative Areas as reported, at various stages of the electoral process, by the

Bureau in charge of the Citizens' Convention Affairs and the Bureau for the Preparation of the Li Fa Yuan.

While it is not advisable to delay the actual establishment of constitutional government, it is also true that it will not be wise to hurry through, without proper consideration, the drafting of the constitution; and since the great fundamental law is closely and vitally related to the welfare and otherwise of the nation, it is recognised that the Committee drafting the constitution should be given ample time to discuss the same and not be unduly urged to hasten their work, which, if done under circumstances of haste, will pack the way with obstacles. On the other hand it is not in accordance with policy to hasten the establishment of constitutional government with the utmost vigour and to respect the will of the people and at the same time to postpone the convocation of the Li Fa Yuan until after the promulgation of the constitution, which is to follow the passage of the constitution in the House of the Citizens' Convention. By law there should have been a Li Fa Yuan composed of members elected by the people during the period the Constitutional Compact was in force. At this time, when we desire to begin anew with the people and when the concern of the people for political affairs is more earnest than ever the Li Fa Yuan provided for in the Constitutional Compact should be organised at an early date in order that the people and the Government may mutually assist one another in their task of securing an efficient administration. A declaration was made last year in the 12th month stating that the legislative organ would certainly be organised within this year. At that time we were already of the view that the people's representative body was vital to the foundation of the country, and that it was impossible under any circumstances to postpone the actual adoption of a constitutional government. The desire of the people to see an efficient administration is now more keen than ever, and the great policies of the State do need their upholding. Although no definite provisions have been made in the Constitutional Compact respecting the time limit within which the Li Fa Yuan should be organised, we in pursuance of our policy to respect the wish of the people and energetically to work for administrative reform, consider this to be instantly necessary and must not be further delayed.

It is presumed that when the law for the election of the members of the Li Fa Yuan was made, the intention of the draftsmen was to emphasise the importance thereof by making the process at once complicated and prolix. In spite of the fact that a special Bureau has been in existence, the sending of telegrams and documents back and forth has taken up a great deal of time. Besides, the financial resources of the local places are limited and if they were to go through the process of election for the Li Fa Yuan as prescribed by law after the preliminary and final elections which have just been held in connexion with the Citizens' Convention, it is feared there will be obstacles in the way and the hope of witnessing the establishment of the Li Fa Yuan within a reasonable time will be falsified. Under the circumstances and for the sake of expediency, the immediate solution is to consider the final election held in connexion with the Citizens' Convention last year as the final election for the Li Fa Yuan, and the successful candidates as well as the reserve members of the final election thus secured as the successful candidates and reserve members of the Li Fa Yuan. As to the single ballot election of the Central Special Electorate and the Combined Electorate of Mongolia, Tibet and Tsinghai, the same shall be held at a date earlier than that originally fixed. The Bureau for the Preparation of the Li Fa Yuan may then be instructed to proceed with the matter quickly. In this manner the spirit of the Constitutional Compact will not be violated, while the procedure prescribed by law will be followed. Thus by a single proceeding the Li Fa Yuan, which is representative of the people, will be established in a short space of time. Such is the sincere desire of the State to forward the progress of constitutional government which is to be put into effect—albeit the circumstances are difficult: —in order to satisfy the longings of the people for a peaceful administration.

While it is recognised that the conversion of the successful candidates of the final election of the Citizens' Convention into successful candidates of the final election of the Li Fa Yuan is only a measure of expediency, the law is in no way violated, as the numbers of the members and the procedure of election are identical with the additional advantage that the progress of constitutional government is hastened. In regard to the making of the constitution, since the same affects the foundation of the nation, the Drafting Committee should be given ample time thoroughly to discuss the same. They should carefully consider what is best and most appropriate for the fundamental organisation of the State, the strengthening of the foundation of the country and the increase of the influence of the nation, and see to it that every step of the process is in accordance with the prescribed programme. The Bureau in charge of the affairs of the Citizens' Convention have proceeded with the election for the Citizens' Convention in accordance with law; and the successful candidates elected as the result of the final election for the Citizens' Convention are to become the successful candidates of the final election for the Li Fa Yuan. Whether this could be done or not, it was our duty to inquire of the acting Li Fa Yuan in accordance with the Constitutional Compact and to request a speedy reply from the same body. This inquiry was accordingly sent to the acting Li Fa Yuan and a reply has been received from the same, stating that a meeting was called and held on the 26th inst., and the House was unanimously of the opinion that, since the procedure for electing the members of the Li Fa Yuan is identical with that for the election of members to the Citizens' Convention and since the people are eager for an efficient administration and the Government—at the beginning of the era of a constitutional government—is desirous of having the Li Fa Yuan established at an early date, the successful candidates of the final election of the Citizens' Convention should be regarded as successful candidates of the final election of the Li Fa Yuan, and the election of the Special Central Electorate and of the Combined Electorate of Mongolia, Tibet and Tsinghai should be abridged to an earlier date for the election of their proportion of members to the Li Fa Yuan. In proceeding in this manner the law will not be violated in the least. A perusal of the organisation law of the Li Fa Yuan shows that its regular session should begin on the 1st day of the 9th month and continue until the end of the year. At this time when the cause of constitutional government is advancing vigorously, the convocation of the Li Fa Yuan should take place at an earlier date than previously fixed so that the Legislature may soon be established and the expectations of the people may be satisfied and the foundation of the nation consolidated.

Besides issuing a separate mandate regarding the convocation of the Li Fa Yuan at a date earlier than that previously fixed, this proclamation is hereby specially issued to the end that the whole country may hear and know.

The session of the Tsan Cheng Yuan in its capacity of Acting National Assembly terminated on February 29, and this really means the termination of its existence as a law making body as its duties will be taken up on May 1 next by the National Assembly.

Progress in connection with the military operations against the republican troops continued to be unimpressive during the latter part of February and early in March. The illness of one of the loyalist leaders, General Ma Chi-tseng, Commander-in-Chief of the forces in Hunan, which terminated fatally, was one cause of delay. The weather was unfavourable to any operations on a large scale and consequently only a little indecisive skirmishing took place.

The pressure of the loyalist troops upon the republicans was steadily continued both in Yunnan and Hunan, and districts that had been occupied by the republicans early in the campaign were recaptured. While the military position continued favourable to the Government in these provinces, some uncertainty was felt in regard to the attitude of Kwangsi, or rather of Lu Yung-ting, the Military Governor. This uncertainty tended to hamper the operations of General Lung Chin-kuang who had led a force of Kwangtung troops into Yunnan with which he captured Poyi or Poyai. It was reported to the Government that Tsen Chunhsuan, formerly Viceroy of the two Kwang provinces, was in Kwangsi endeavouring to persuade the local troops to revolt, and it was also said that Liang Chi-chao, or his emissaries, were similarly employed. Early in March Lu Yung-ting accepted the post of Pacification Commissioner of Kweichow that had been offered him by the Government, but after leading a force of 3,000 troops from Nanning to Liuchou he declared the province of Kiangsi independent. This was on March 10, but for some time it was not clear whether Lu was acting on his own initiative or had had his hand forced by his subordinate officers. At the moment of writing this point remains obscure.

The secession of a third province at a time when matters were shaping well for the Government in a military sense was undoubtedly serious. It has been generally expected that any significant success by the republicans would result in accessions to their ranks, but when a third province joined them just after their forces had sustained a series of defeats in the field, it became obvious that a sentiment deeper than a desire to be on the winning side was operative.

The Kwangtung troops under General Lung Chin-kuang were placed in an exceedingly dangerous position. Before them were the Yunnanese and behind them the Kwangsi forces. The course that this General will adopt is a matter of speculation, though the suggestion is made in republican quarters that he will be compelled to espouse their cause. As his brother, General Lung Chi-kuang, is Military Governor of Kwangtung it will be realized that the situation is extremely complicated. The Government, however, have professed perfect confidence that General Lung Chi-kuang will remain loyal.

In connection with the elections for the National Assembly, a Mandate was issued on March 14 ordering the single election of the Central Special Electoral College to be held on April 10, and that for the United Electoral College of Mongolia, Tibet and Chinghai on April 15. The provincial members were elected some time since. The suggestion has been made that when the National Assembly meets in May the question of the form of government will be reconsidered, but this statement has been denied semi-officially.

The Emperor-Elect on March 4 issued a long mandate dwelling on the necessity of unity in the present crisis in the affairs of the country. He urged the people to abandon personal and partizan feeling and to co-operate to preserve the country intact.

On March 6 news of the first significant success of the loyalist troops was published in Peking, the announcement being made that the city of Suifu has been recaptured. The fight for the city actually began on March 1, when the loyal forces under Brigadier-General Feng Yu-hsiang attacked 3,000 republicans who had fortified the hills surrounding Suifu. Some success was gained, and on the following day all the republican positions on the left bank of the Yangtze were captured. The dispatch from General Feng stated that the republicans had sustained heavy losses and were in full flight. The loyalist losses were over a hundred men killed and wounded. A later dispatch stated that on March 3 the victory was followed up and the recapture of Suifu completed. The losses of the republicans were estimated to be over a thousand killed.

Fighting also occurred in Hunan and Yunnan early in March. In the former province over four hundred republicans were killed at Kaotsun, and in Yunnan a loyalist detachment after severe fighting captured the city of Poyai. Though not of decisive importance from a military point of view, these loyalist successes have certainly had considerable political effect. It would be idle to deny that in certain localities, especially in the Yangtze Provinces, there are sympathizers with the republicans who would probably be stirred to action if the latter won any signal success. On the other hand defeat would just as inevitably entail a diminution of sympathy, or at least prevent its translation into practical co-operation. The expulsion of the republicans from Suifu and Nachi therefore, especially as it has been followed up by loyalist successes in Hunan, may be expected to prevent the spread of the rebellion beyond its present bounds. That the Government attached considerable importance to the recapture of Suifu was shown by the issuance of a mandate on March 7 creating General Feng Yu-hsiang a Baron. Another mandate issued the same day appointed the Military Governor of Kwangsi, General Lu Yung-t'ng, Pacification Commissioner of Kweichow. Later Pacification Commissioners for Yunnan and Hunan were appointed.

A Reuter's Agency telegram from Chengtu, dated March 9, announced that Government troops had been dispatched from Suifu and Luchow towards Kiangmen with the object of cutting off the Yunnanese in Kianganhsien and Nakkihsien from communication with the south. This message also stated that the Kweichow troops had retired from Chikiang, around which city there had been heavy fighting, to positions within their own border.

During the next few days a succession of Government victories was announced. The Yunnanese were defeated at Nanchi and expelled from both banks of the upper Minkiang. In Hunan the city of Mayang was recaptured, the Kweichow troops retreating in disorder.

After it became apparent that the Government forces in Szechuan and Hunan had the upper hand, the Government decided to reconsider the whole situation without prejudice. While it was almost beyond the bounds of possibility that the republicans could achieve success by arms, there was an obvious danger that hostilities might be prolonged for a considerable time, and much distress caused in consequence. There was also the grave danger of intervention by Japan. That country had given many clear manifestations that, if she were accorded a colourable excuse, she would seize the opportunity to land forces to "protect foreign interests." In order to maintain the fiction that she is playing an important part in the world war, Japan is naturally anxious to take any chance of showing that she is performing work that her allies are debarred from attending to themselves. Intervention in China would, therefore, enable her to gain, or at least to claim, credit in this direction, while at the same time advancing her own policy in regard to China.

These considerations finally induced the Government to decide to take such action as would bring the internal strife to an end. A mandate cancelling the monarchy was actually in course of preparation when the news of the secession of Kwangsi was received. This secession naturally complicated matters but despite the chance that "face" would be lost owing to the impression being given that the Government had been forced to cancel the monarchy because of the secession, it was decided to take action, particularly as telegrams had been received from several of the Military Governors, including General Chu Jui of Chekiang and General Feng Kuo-cheng of Kiangsu, recommending that some steps should be taken without delay to improve the situation. A telegram of the first importance was received from General Lung Chi-kuang, Military Governor of Kwangtung, stating that the situation in that province was most serious. A summary of the mandate was communicated to all Provincial Governors and it was formally issued on March 22.

The immediate result of the cancellation of the monarchy will be the return to the Government's service of most of the men who for conscientious reasons have maintained aloofness since the monarchy movement developed. As is well known there is thought to be disgrace in serving two dynasties, and consequently many of the ablest men in China deemed themselves debarred from assisting Yuan Shih-kai after he had been offered and had accepted the Throne. Mr. Hsu Shih-chang, the former State Secretary, promptly resumed office, the mandate of cancellation, in fact, being signed by him.

Advice to Yuan Shih-kai

Before its declaration of independence, a telegram was despatched from the Province of Kwangsi, asking Yuan Shih-kai to retire from his post. The telegram, which bears over twenty signatures including those of Field Marshal Lu Yung-ting, Mr. Liang Chih-chao, General Chen Ping-kun, recently appointed to act as Chiangchun of Kwangsi upon the departure of Field Marshal Lu for the front as Pacificator of Kueichow, Wang Tsu-tung, Civil Governor of Kuangsi who was before considered the most trusted servant of Yuan, and Taoyins and military commanders, reads as follows:—

Your Excellency Yuan, the former President.

"We regret to say that since the enforcement of the monarchical system, popular wrath has reached boiling point, and the Yun-Kuei have taken you to the task, resulting in the outbreak of hostilities which have continued from winter to spring. To what extent our national danger will grow, we are unable to say. But the source of the evil can be traced to your oppressive policy relentlessly pursued during the past several years causing disaffection and hatred amongst our people; while the demon of slaughter has been let loose, by your selfish plot to steal the country, during several months, courting ridicule and contempt from foreign countries. We find that Article 16 of the Provisional Constitution provides that the President shall be responsible to th people. As Your Excellency's misgovernment and violation of the constitution are witnessed by millions of eyes, on whom could you lay your responsibility for these lamentable consequences? As the Yun Kuei have risen in upholding a righteous cause, they cannot retrace their steps. Should Your Excellency persist in your foolhardy dream, by what stratagem can you save yourself? I, Lu Yung-ting, holding office in a frontier province, deem it my first duty to preserve peace. I, Liang Chih-chao, having travelled through many places, feel much alarmed at the piteous plight of our people. We vividly recollect the event of the Year Hsin-Hai (1911). The former Ching House, having ruled almost 300 years, was nevertheless unable to bear the sacrifices of the people's lives—it preferred to abdicate the Throne. Now, Your Excellency has been doing just the opposite; and wishing to appropriate the country as your private property, you feel no compunction in causing the massacre of thousands of human beings and in hastening the downfall of our nation. Do you feel ashamed of yourself when compared with the defunct dynasty? Moreover, your end will never be gained, and you will only be laughed at. You deem yourself a wise man. Has ever a wise man acted thus? Lu Yung-ting and others, in view of our friendship and colleagueship for a number of years, cannot bear to see Your Excellency in sacrificing the country, sacrifice yourself in the end. We earnestly tender you our sincerest advice that you resign your office on date as an expression of apology to the world. Then Lu Yung-ting and others will persuade our Yun-Kuei patriots to lay down their arms on the same day. Your Excellency will thus be able to demonstrate your true ambition, while the country will be immediately relieved of the threatened danger. As the situation has become most critical and must be retrieved without a moment's delay, Your Excellency is earnestly requested to give us a reply within 24 hours, in order that we may know what to do. We are waiting your order in painful suspense meanwhile.''

The following is the *Peking Daily News* translation of the mandate cancelling the monarchy issued on March 22.—

> Since the inauguration of the Republic, troubles and disturbances have come in rapid succession; and I, a man of little virtue, have been obliged to shoulder the most difficult responsibility. Patriots of this country, who have cherished the fear of imminent dangers, have advocated the restoration of monarchy with the object of averting quarrels and securing permanent peace. Since the time of the Second Revolution our ears have been filled with their arguments; but from time to time I have discouraged their movements. However since last year the circumstances have been greatly changed and I have been unable to suppress their opinion. They have unanimously said that "unless a constitutional monarchy be introduced, the existence of the Chinese nation will never be preserved. If internal quarrels and contentions, similar to those taking place in Mexico and Portugal, should commence in this country, it will meet with the fate of Annam and Burma." Consequently the majority of people have advocated the restoration of monarchy, and these actions have been supported with good reasons. Generals, soldiers, officials and common people have acted with one accord, they lately sent in a large number of telegrams and memorials, earnestly craving that I should change the form of State by using the influence of my present position. I made repeated declarations of my heart, but they were not heeded by the people. Later on the Acting Li Fa Yuan passed a resolution that the problem of the form of State should be decided by the Convention of Citizens' Representatives; when the convention took place the Citizens' Representatives of all provinces and Special Administrative Areas unanimously voted in favour of the Constitutional Monarchy, and elected me to be the Emperor. As the sovereign authority of the Chinese nation is lodged with the whole body of the people of the country, I could not raise any opposition when the question was finally settled by the whole body of Citizens' Representatives. However, my heart could not be at ease if I should ascend the Throne by breaking my oath of inauguration and disregarding principle and faithfulness. I showed my sincerity and modesty by refusing to accept the post of honour. But the said Yuan insisted that the oath of the Chief Executive was based upon the position he held at that time, but now as the condition changed he should follow the will of the people. Hence I could not make any further excuse on account of the grave responsibility forced upon me. However, in order to satisfy temporarily the public desires I proceeded with the preparatory works, and no actual steps were taken. After the outbreak of the trouble in Yunnan and Kweichow, I promulgated a mandate ordering that the preparatory works should be delayed, and that no more petitions requesting the enthronement should be transmitted to me. Then I promulgated another mandate hastening the convocation of the Li Fa Yuan with the hope of ascertaining as soon as possible the real opinion of the people, and devising some means to relieve me of the difficulty.
>
> Indeed I remember that after meeting so many reverses and disasters, I had not the least desire to attend to the affairs of the State; and when I lived in retirement at Huan-shang I was happy because I was kept ignorant of the real situation of the country. When the outbreak of the Revolution of 1911 took place I was obliged to come out from my place of retirement, my services being required by the people of this country. When I was called to manage the critical situation of this country I determined not to know anything but the salvation of the nation. One can observe in the Chinese history of several thousand of years how the descendants of Emperors of every dynasty have met tragic ends; and why should I be ambitious for the highest post of honour of the country? However, the Citizens' Representatives have not had any sympathy on the sincerity of my refusal to accept the Throne; while a certain portion of the people think that I have sought selfish interest. Through misunderstandings the present trouble has arisen. My sincerity has not been sufficient to move the heart of the people, and my understanding has not been able to read the signs of the times. It is the lack of virtue on my part, and therefore I have no right to blame others. My people have now been inflicted with misery and my Generals and troops have now borne hardships. The people have been seized with consternation, and commerce and industry have declined. When I think of them I do feel sorry, I do not hesitate to sacrifice my own opinion in order to adopt that of others.
>
> I hereby declare that I still recognize that the memorials and documents transmitted to me through the Acting Li Fa Yuan in connection with the request for enthronement are inconsistent with the present condition of the country. The Bill passed on the 11th day of the 12th month of last year on the recognition of monarchy is hereby cancelled, and the State Department is hereby instructed to return to the Acting Li Fa Yuan all the petitions urging enthronement from the provinces and special administrative areas, so that they may be returned to the original petitioners to be destroyed. All preparations for the restoration of monarchy are hereby stopped. Thus I hope that by imitating the repentance and remorse of the ancients, the love and grace of Heaven will be received. We will cleanse our hearts and thoughts, so that trouble will be averted and the people will obtain peace and tranquillity.
>
> I believe that those who have advocated the restoration of monarchy are men trying to consolidate the foundation of the nation; but by using wrong means, they have injured the interest of the nation instead of promoting its welfare. On the other hand those who have opposed the restoration have only been expressing their political ideas; and I believe they will not be so obstinate as to bring the nation to the verge of destruction. At this critical juncture it is imperative that all should act according to the dictates of their conscience, abandoning their prejudices, and uniting their energy together in order to bridge over the present difficulty. Thus the sons and descendants of this celestial land will avoid a family quarrel, and then instead of disasters and woes there will be peace and prosperity.
>
> In a word for the sins and crimes of the people in all directions of the country, I am willing to bear them all. Now the Bill which was passed by the Li Fa Yuan, has been cancelled; and should any try to create disturbances in any locality they shall be held responsible by the authorities. I, the President, am responsible for the administration of the whole country, therefore, it is impossible for me to remain inactive awaiting the destruction of the nation without putting forth efforts to effect its salvation. The present condition is indeed deplorable: people everywhere have suffered, laws and principles have not been observed, administration has not been improved, and the services of men of talents and ability have not been secured. When I think of it in the midnight, I would always get up; and if the same state of affairs should continue, this nation will not be able to remain in the world. Hereafter all civil and military officials should do their best to do away with the accumulated corruptions and bad practices and to achieve merits. They should proceed in earnest to perform the tasks assigned to them and to introduce all kinds of administrative reforms. They should not indulge in empty words, and cherish prejudices. I will institute thorough investigations, and my great principle for the administration is that all merits should be rewarded and demerits punished. All Generals, officials, soldiers and common people should therefore understand and appreciate my ideas.
>
> [We are indebted to the *Peking Gazette* for the other translations of documents used in this article.—Ed].

Simultaneously the resignation of Mr. Lu Chang-hsiang of the post of Secretary of State was accepted, Mr. Lu was instructed to confine himself to his duties as Minister of Foreign Affairs, and Mr. Hsu Shih-chang was gazetted Secretary of State.

SOURCE OF BORNEO TALLOW

Illipe Nuts as the source of Borneo Tallow are discussed in an Imperial Institute bulletin in which it is pointed out that there has been for some time a confusion as to the source of the fat due largely to the variety of native names for the seeds yielding it. Mr. K. Heyne, curator of the Museum for Economic Botany, Buitenzorg, Java, has examined the seeds and kernels of several species yielding Borneo tallow and their fats submitted to chemical examination.

The principal interest in this fat, from the point of view of industry, is that it is especially suitable for the manufacture of edible fats, especially of the fats known as chocolate fats and used for incorporation with cocoa powder in the preparation of chocolate for eating purposes. It is highly desirable that the kernels should be exported as fresh as possible, but nearly all the fats examined had high acid values, through being rancid, owing to the length of time the kernels are kept before being exported.

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THE CHINESE NATIONAL ASSEMBLY

The decision of the Chinese Government to hasten the assembling of a more or less representative body at Peking to undertake legislative work is undoubtedly a wise step. At this late date, when much of the bitterness that prevailed in 1913 has disappeared, it is neither necessary nor desirable to consider too closely the causes which prevented the National Assembly of that year from accomplishing anything conducive to the advancement of the country. But it is as well to recall that during the elections the menacing tone adopted by the Kuomintang Press inspired little hope of a working compromise being arrived at between members of the party and the supporters of President Yuan Shih-kai. The unfortunate murder of one of the Kuomintang leaders upon the eve of the assembling of Parliament added fuel to the fire. The Kuomintang included many of the brightest and most promising of young Chinese publicists, but the party as a whole lacked balance, and was unable to recognise that the condition of the country and the necessities of the times imperatively demanded the cultivation of a spirit of compromise. Convinced as they were that the immediate application of the principles they professed would at once transform the social and economic life of the country, they were impatient with those who held the belief that reform should only be effected slowly and cautiously. Goodwill, and a mutual desire to understand the point of view of the opponent, would probably have led to the adoption of a course that was neither revolutionary nor reactionary. Unhappily, the spirit of conciliation was not manifested, and the breach deepened daily after the Parliament had met. As a result the business of the country was neglected in order to wage futile partizan battles and when, as an indirect result of the rebellion in the middle of 1913, the Kuomintang members of the National Assembly were unseated and that body's active existence terminated, the loss to the country was more moral than material. That there was a moral loss is undeniable. Inevitably, in spite of the Revolution, there were still many men of standing and influence who were either openly or secretly opposed to reform and innovation, and these were enabled to strengthen their position by representing the failure of young and inexperienced politicians to envisage realities as a failure of constitutional methods. There was also some material loss, as the services of many of the ablest men in the country were lost to the Government, at least temporarily.

In 1914 and 1915 the system of government was republican in name, but there was nothing republican in its character. The people of a republic are, at least in theory, supreme, but in China during these two years the people had no more to do with the Government than they had had under the Manchu dynasty. This is not written in a spirit of condemnation; the fact is simply recorded so that the situation may be clearly understood. It was probably necessary in the conditions that prevailed that the Government should temporarily be autocratic. It was recognised, however, that though the first phases of consolidation might be better effected under autocratic rule, progress was only possible under a constitutional government. Consequently a Constitutional Compact was formulated confirming the right of the people to self-government and a Commission was appointed to frame a permanent Constitution, which was later to be submitted to a National Convention. Arrangements were also made for the convocation of an elected National Assembly as soon as the permanent Constitution was promulgated. If there had been no modification of these arrangements, the National Assembly would have met in September next.

A new situation was created in the latter half of 1915 by the inception and development of the monarchical movement. A record of the progress of this movement has been given in former issues of the FAR EASTERN REVIEW and need not be repeated here. Necessarily the labours of the Constitution Commission were suspended until the verdict of the people on the question of the form of government was given. After that verdict had been recorded, and H.E. Yuan Shih-kai had accepted the throne, the insurrection broke out in Yunnan, the ostensible object of the leaders being to maintain the republic. Although the Government was confident of its ability ultimately to quell the insurrection, it was obvious, as the scene of operations was remote from the centre of military power and facilities for the transport of a punitive expedition poor, early success could not be hoped for. In the meantime, while the military plans were being developed, the Government very wisely took into consideration means of hastening the establishment of the constitutional regime. Owing to the advice proffered by certain of the Powers at the instance of Japan, the formal enthronement of the Emperor-Elect was postponed, but it was felt that even the anxious solicitude of Japan for the welfare of the country would hardly prompt it to try to prevent the earlier assembling of a Parliament.

By singular good-fortune the Government, having decided that a Parliament in being was necessary, found one to its hand, ready-made, so to speak. It had originally been intended that a National Convention should be elected for the sole purpose of considering the draft Constitution. In order to give full authority and weight to this body, the election law regulating its creation was made practically identical with that for the National Assembly. Most of the members had already been elected when it was decided to hasten the convocation of the National Assembly, and the happy expedient of investing the members of the National Convention with full legislative powers was adopted. A Mandate, that is published elsewhere, gave legal effect to a recommendation by the acting National Assembly that this course should be taken, and it will, therefore, be possible for a legislature to assemble four months in advance of the date originally fixed.

For many reasons it may be anticipated that the new National Assembly will avoid the mistakes of its predecessor. It will be much more conservative in character, the franchise being such that both electors and candidates were men whose age and antecedents practically guaranteed sobriety of thought. While a wide franchise would be more in accordance with the tendencies of the times, in the special conditions that prevail in China it is essential that its legislature should consist of men practical rather than idealistic. A characteristic of youth is impatience with slow progress, and Young China has already shown that it wished to hustle the country along at a speed that left it so breathless that it sullenly determined that the snail-like movement of the past was better for its constitution. In that, of course, it was in error, but obviously a moderate pace will be advisable until the country becomes accustomed to the rarer air of the higher level along which its path lies. The new National Assembly, therefore, if it should prove to lack brilliance will, perhaps, be the better fitted to perform the important preliminary work of consolidation which is essential before real progress can be made.

CHINA'S MANDATES

If the mere flourishing of the Vermillion pencil could exercise transmuting power we would have miracles in China. Most of the reforms required to convert the country into a thoroughly modern state have at one time or another in past years been glorified in classic style either in Edicts of the old Manchu regime, in Mandates of the Republican regime, or in Mandates of this temporary or otherwise period of *Hung Hsien*. It would seem, however, that the Edict or the Mandate is the catafalque on which the idea is conveyed to its grave, for few seem to survive. The serious, but unsophisticated stranger in the land would probably take the solemn promulgation of apparently earnest Mandates as undoubted evidence of determination on the part of the rulers of China to fall into line in matters of government with the most advanced of the world's Powers. And while it might be doing an injustice to those who laboriously prepare and issue the Mandates to suggest that they were promulgating them with their tongues in their cheeks, the fact remains that once the Mandate is published no more attention is given to the subject either by those who whipped it into form, by those who sped on its way the finished product, or by those officials in the Provinces who are supposed to translate orders from the Capital into deeds. The whole process of Mandate making in the past has been so closely related to the farcical that the gravest difficulties confront the authorities who might wish classical ebullitions to be taken seriously. The provincial officials have by time-honoured recognition of their right to neglect their duties come to regard the Mandate as so much caligraphy designed to ornament Yamen walls, or to contribute to the delectation of the literati who might wish to study up-to-date composition. That a Mandate is made to be put into effect never occurs to them. Their duty, as they conceive it, is done when they hand it to the yamen runner to paste on the board outside the gate. If the general public condescends to come and read the document well and good, if any of them feel moved to give effect to the commands contained therein so much the better—and that, even, is more than Peking has the right to expect! The official seldom stirs out of his yamen, nor has any one the least ground to entertain the thought that he should. To suggest that he should take a Mandate seriously and contrive the means to carry into effect its commands would be an unforgivable impertinence. No provincial official in China would be guilty of so gross a dereliction of official etiquette as to bestir himself early in the morning with the object of accomplishing a man's work before nightfall. The Provincial official has his own notions of what his mission on earth is, and he takes a whole day over cups of the best Hangchow green tea, to contemplate it, the result being by no means the precedence of his own comfort by his country's affairs. One of the most urgent reforms called for, therefore, is a change in the treatment of the Mandate by provincial officials. We have been given to believe by certain evidences that conditions are changing for the better in China. Being optimistic we believe we can see marked improvement in many directions, and certainly we know of many officials and civilians who are earnestly desirous of breaking effectively with the past, which seems to have, unhappily, a strangle hold upon the present. When the day comes that the Mandate can be enforced, or rather that the official in the provinces will regard it as his prime duty to lose sleep until he has taken the measures required to put a given Mandate into effect, then will we believe that there is real hope of China marching on to the greatness her people deserve. It will, however, need more than a Mandate ordering Mandates to be respected to effect this desirable change.

THE HANKOW RECONSTRUCTION LOAN

The agreement entered into between the Chinese Government and Messrs. Samuel & Co., Limited, on September 19, 1914, for the reconstruction of Hankow was renewed for a further year on February 8, when Messrs. Samuel & Co.'s Peking representative concluded negotiations with that object, by paying over the silver equivalent of £30,000 as an advance. In making the advance the following terms were arranged:

(1). That Samuel & Co., Ltd., have an extended option on the Loan Agreement until Two (2) Years after Peace has been Proclaimed with regard to the War.

(2). Interest on the Advance is to be payable half-yearly through the Bank of China.

(3). In the event of it being found impossible to float the "Hankow Improvement Loan" on or before Two (2) Years after Peace has been Proclaimed, then the Chinese Government will repay the amount of the Silver Advance in full, together with all Interest monies due at the time repayment is made.

(4). During the extended period of the Agreement. (i.e. until two years after peace has been proclaimed), the Chinese Government will not compel Samuel & Co., Ltd. to float the first issue of the Bonds if the conditions of the European markets are unfavourable.

(5). The Chinese Government will purchase outright and Nationalize the existing Electric Light & Waterworks Company's workings and undertakings at Hankow by the means of an Internal Domestic Loan, which is to be specially floated for that purpose. The outlay for the purchasing and nationalizing the said works and undertakings is to be refunded to the Chinese Government at a later date out of the proceeds of the first issue of the "Hankow Improvement Loan" Bonds.

As the Government is not yet prepared to nationalise the Electric Light and Waterworks the Company is endeavoring to arrange for a loan from American financiers to enable them to dispose of present obligations and enlarge their equipments to cope with present increasing demands. If financial arrangements are completed with this object the Government will, when the time comes for nationalization, refund the capital loaned by the American financiers.

Commenting on the extension of the agreement with Messrs. Samuel and Company the *Peking Daily News* says:—

"The terms agreed upon have the full support and approval of the Chinese Central Government as is evidenced by the fact that the Waichiaopu have officially notified the British Minister in Peking, who has been requested to record the details for future reference. The Minister of Finance and the Minister of the Interior, both of whose signatures were appended to the original "Hankow Improvement Loan" Agreement in September, 1914, on behalf of the Chinese Government, have also been notified of the new terms agreed upon.

"Under the original agreement of September 19th, 1914, the existing Hankow Electric Light & Waterworks Company was hypothecated to Samuel & Co., Ltd., as one of the collateral securities for their Loan. The fact that the Chinese Government have now entered into an undertaking with Samuel & Co., Ltd., to purchase and nationalize the Hankow Electric Light & Waterworks Company through the flotation of an Internal Domestic Loan goes to prove the seriousness with which the Central Government view the future importance of the Hankow Improvement Scheme. Once the Internal Domestic Loan has been floated and the purchasing transaction has been completed, the Electric Light & Waterworks will become the sole property of the nation, with the profits derived, which we understand average well over three hundred thousand annually, becoming still another source of income for the country's exchequer. There seems to be no reason why the existing Electric Light & Waterworks should not be under state control, always provided proper management is arranged for, and in arriving at their decision the Chinese Government appear to have agreed to a course of action which calls for nothing but congratulations. Foreign capital is always welcome for the encouragement and development of industry and commerce, but if Chinese capital is available so much to the advantage and credit of the country."

CHINA'S RAILWAYS IN 1915

From the following tables it is possible to gain an accurate idea of the financial situation at the end of 1915 of the Chinese railways now operating. This is rendered possible owing to the adoption of the unified system of accounting recently introduced by the Ministry of Communications—a system which is perhaps the most complete of any in use in the world. Before the system was elaborated by the special commission appointed for the purpose accounts varied as did the railways and it was never possible to make even an approximately accurate comparison of the working of the various lines. Each line had its own method of accounting, and when it is remembered that some of the lines are British, others Belgian, others French, others German and a few Chinese it may be realised how great a variety of systems were used. This has all been done away with now, and the new unified system is employed on all lines to the distinct advantage of the country and the satisfaction of the public who may wish to make comparisons. The tables given below are the first issued under the new system and the figures given are derived from reports based on headings which permit of no juggling of figures to swell receipts or diminish expenses or in any way to confound the investigator. An interesting development of the introduction of the system is the application by private railway companies for the forms so that they may be adopted, it being recognised that their employment will in the long run diminish the irregularities that have prevailed in the past.

In connexion with the tables given below it must be mentioned that the estimates were prepared in 1914, before the war, which accounts for the estimate of receipts being high and expenses low. It is more gratifying, therefore, that the receipts still show an increase, despite the disabilities caused by the war, particularly as the cost of all kinds of materials rose greatly in price.

Statement of the approximate totals of revenues and incomes of the Chinese Government Railways during 1915 as compared with the estimates.

Lines	Estimated figures	Actual receipts	In excess of the estimate	Less than the estimate
Peking-Mukden	$12,672,400.00	14,768,000.00	2,095,600.00	
Peking-Hankow	16,681,100.00	16,560,000.00		121,100.00
Peking-Kalgan	2,668,566.00	2,721,500.00	52,934.00	
Kalgan-Suiyuan	905,084.00	880,940.00		24,144.00
Tientsin-Pukow	8,063,006.00	8,298,000.00	234,994.00	
Cheng-tai	2,416,125.00	2,116,549.71		299,575.29
Taokow-Chinghwa	593,335.00	633,000.00	39,665.00	
Shanghai-Nanking	3,484,500.00	3,436,800.00		47,700.00
Shanghai-Hangchow-Ningpo	1,878,000.00	2,070,000.00	192,000.00	
Canton-Kowloon	917,380.00	874,000 00		43,380,00
Kirin-Changchun	634,857.00	970,912.00	336,055.00	
Chuchow-Pingsiang	726,489.00	690,200.00		36,289.00
Canton-Samsui	530,325.00	851,568.00	321,243.00	
Kaifeng-Honan	1,160,502.00	1,154,600.00		5,902.00
Changchow-Amoy	38,030.00	41,080.00	4,050.00	
Total:	53,368,699.00	56,067,149.71	3.276,541.00	578,090.29
Balance			2,698,450.71	

Statement of Operating and Interest Charges of Chinese Government Railways for 1915 as compared with the estimates.

Lines	Estimated Figures	Actual Expenses	Balance Less than the estimates	In excess of the estimates
Peking-Mukden	$6,779,368.00	7,735,000.00		955,632.00
Peking-Hankow	10,252,681.00	10,700,000.00		447,319.00
Peking-Kalgan	2,318,858.50	2,052,700.00	266,158.50	
Kalgan-Suiyuan	1,441,022.20	999,806.20	441,216,00	
Tientsin-Pukow	9,824,124.00	11,051,000.00		1,226,876.00
Chengtai	2,091,434.00	2,021,336.00	70,098.00	
Taokow-Chinghwa	917,816.00	882,000.00	35,816.00	
Shanghai-Nanking	3,962,500.00	3,928,600.00	33,900.00	
Shanghai-Hangchow-Ningpo	3,006,000.00	2,371,000.00	635,000.00	
Canton-Kowloon	1,775,430.00	1,739,582.39	35,847.61	
Kirin-Changchun	1,374,534.00	1,447,999.00		73,465.00
Chuchow-Pingsiang	647,638.00	764,400.00		116,762.00
Canton-Samsui	305,416.00	579,067.00		273,651.00
Kaifeng-Honan	1,502,384.00	1,442,700.00	59,684.00	13,742.00
Changchow-Amoy	188,258.00	202,000.00		
Total:	$46,387,463.70	47,917,190.59	1,577,720.11	3,107,447.00
Balance				$1,529,726.89

Statement of the approximate balances between Receipts and Expenses (including interest and all other charges) of Chinese Government Railways for 1915.

Lines	Receipts	Expenses	Balance Profit	Loss
Peking-Mukden	$14,768,000.00	7,735,000.00	7,033,000.00	
Peking-Hankow	16,560,000.00	10,700,000.00	5,860,000.00	
Peking-Kalgan	2,721,500.00	2,052,700.00	668,800.00	
Kalgan-Suiyuan	880,940.00	999,806.20		118,866.20
Tientsin-Pukow	8,298,000.00	11,051,000.00		2,753,000.00
Chengtai	2,116,549.71	2,021,336.00	95,213.71	
Taokow-Chinghwa	633,000.00	882,000.00		249,000.00
Shanghai-Nanking	3,436,800.00	3,928,600.00		491,800.00
Shanghai-Hangchow-Ningpo	2,070,000.00	2,371,000.00		301,000.00
Canton-Kowloon	874,000.00	1,739,582.39		865,582.39
Kirin-Changchun	970,912.00	1,447,999.00		477,087.00
Chuchow-Pingsiang	690,200.00	764,400.00		74,200.00
Canton-Samsui	851,568.00	579,067.00	272,501.00	
Kaifeng-Honan	1,154,600.00	1,442,700.00		288,100 00
Changchow-Amoy	41,080.00	202,000.00		160,920.00
Total:	56,067,149.71	47,917,190.59	13,929,514.71	5,779,555.59
			$8,149,959.11	
Net Profit				

So far reports for the individual railways for the year 1915 have not been completed and the only reports available that have been produced in accordance with the regulations for the unification of accounts are for the half year ending June 30, 1915. At that date the Government Railways in operation in China totalled 5,701.47 kilometers, in addition to which there were 241.83 kilometers and 2,399 kilometers or what are described as Concession Railways.

The rolling stock in operation at that period was 627 locomotives, of which 162 were passenger, 330 freight and 140 shunting. There were 823 passenger carriages, 103 being first-class, 214 second-class, and 576 third-class.

Passengers to the number of 13,000,000 were carried during the six months, the bulk of that being third-class, the percentage being 96.54, while the second-class passengers amounted to 2.76% and the first-class 0.7%. The revenue from this source was $11,120,059.

CHINA AND ROADS

It will be gratifying to all who are interested in the development of China, and particularly to those whose business compels them to traverse the interior, to see that the Government is taking some notice of the efforts that have from time to time been made to have the great thoroughfares of the country improved. Centuries ago China had good roads, roads that probably rivalled those of any contemporary country, not excepting the famous highways made by the Romans, but during the past century the art of public utility building, like the art of porcelain making, has died a natural death, and present day inhabitants of coast ports or distant inland cities are similarly cursed with the most lamentable apologies for roadways that modern man has had to put up with.

Considering the historic aptitude of the Chinese for solid constructional work there is no excuse for the conditions that now obtain. The Chinese people have a natural talent for engineering work which could easily have been developed for the good of the country by far-sighted officials. The magnificent bridges, the walls of cities, the great conservation works which still stand and defy time in numerous parts of the country are monuments in themselves to the genius of the past and should be constant reminders to all officials of the present period that continuation of the disgraceful policy of neglect which plunged the Manchus into oblivion will bring about the absolute ruination of the country and compel the much-dreaded foreign control or partition to be inaugurated.

That there are officials who fully realise the vital necessity that exists for immediate revision of methods of administration, and for the introduction of reforms making for industrial development is, we are glad to say, a fact, but it must be confessed that they are so far working against painful odds in the shape of a large body of conservative and ignorant adherents to office who contribute practically nothing in the shape of sound assistance to the government of the country. These men constitute the incubus which if not speedily removed will bring about the loss of the independence of China, cause her people to be placed under the tutelage of some foreign power or powers, and destroy the centuries-long record as a national unit which China has managed so far to maintain despite the great world-movements of past decades. The few officials in high places who are alive to the importance of development upon modern lines do when possible take occasion by the hand to advance the interests of China, but more often than not their efforts are nullified by the crassly stupid activities of misguided reactionaries.

That there is a great general improvement over the conditions which obtained five or six years ago, however, is undoubted, and it is to be hoped that the further evidence of realization of one of China's chief woes—a lack of roads—as furnished by a Mandate issued on February 27 will materialize in some forward policy being adopted calculated to improve the thoroughfares throughout the country. By properly systematising the work the Government could begin road building at once without recourse to foreign loans, there being sufficient prison labour available to make a great advance upon a road to serve as a model for the various communities who should themselves find the labour to construct sections of other roads within their own particular localities. Co-operation between Government and local officials should enable lengthy roadways to be built, and unless the Mandate referred to above, which is given below, is to be allowed to go the way of hundreds of others we ought before long to be recording a general awakening throughout the country to the importance of modern means of communication. The Mandate is as follows:—

> It is the duty of the Government to facilitate the communications of the interior of the country. We have noticed in all foreign countries, that special efforts have been made by authorities to improve public roads. In former days the "official" roads and postal "sections" had the idea of national roads; but as the people have only followed the rules fixed in ancient time, no material improvement has been made. As we have been satisfied with the simple and primitive ways, we have been laughed at by men of experience. Since the introduction of steamers and railways, there have been great changes in connection with communications, rendering it more important to improve the public roads of the whole country. As the districts under the jurisdiction of the Metropolitan Prefecture, have been fixed as a model for self-Government system, the improvement of public roads should be promoted; and the Governor there is hereby instructed to institute an investigation regarding the roads which should be repaired. He shall divide all the roads into the "national" and the "hsien" ones; and by introducing improvements he shall set an example for other districts to copy. As to the roads in the villages and hamlets, he shall order the chiefs of the same to improve them according to local circumstances. The chief officials of the provinces and special administrative areas are also instructed to order their respective subordinate officials in the Tao or Hsien districts to proceed to improve the roads according to local condition. According to the custom of this country bridges and roads of the villages and hamlets are to be cared for by the inhabitants themselves, who have considered them as charity works. The local officials are therefore ordered to encourage them in these good works, and not to force them by influence. Those who have contributed large sums voluntarily and have achieved merits shall be liberally rewarded so that others may be encouraged. The Ministry of Interior is hereby instructed to draw up a set of regulations on the improvement of roads for our approval.

THE HOKKAIDO TIMBER INDUSTRY

The Wealth of Japan's Forests

No country has a greater proportion of its total area productive of timber than Japan. With the exception of the Kuriles group and the summits of a few high mountains, because of the fertile soil and the humidity of the climate, there is no part of the whole Empire that is unsuited to the growth of forest trees, and hence the production of timber of practically every quality. These forests found everywhere have such luxuriance of growth that they are strikingly primitive in appearance. To reduce it to figures, the most recent statistics compiled on the economic development of the Empire show that the natural forest area is immense, measuring 19,173,717 cho, lacking just .3 of one percent of being one half the area of the whole country. And these figures do not include Formosa, Korea and Karafuto, nor do they include big stretches from which much valuable timber is marketed, known as *Genya*, or plains, a class of land established at the time of the land tax revision, inaugurated soon after the restoration.

Of all this vast area covered with forests, more than 25 percent, or 4,968,433 cho, is in Hokkaido, where the timber industry has been of much more recent development, but which now is exporting timber, logs and sawn lumber, consisting chiefly of pine and various grades of oak, to the foreign market. The mountain ranges, which cover the entire island with their lateral branches, constitute splendid forest lands, the conifers growing on the slopes, while at the tops and bases the broad-leafed trees predominate.

In 1914, the last year for which statistics are available, Hokkaido exported pine and oak, and a small amount of other Japanese wood, to the value of 6,519,222 Yen. Practically all of the export material was for furniture making and for railway sleepers. Of the entire amount China and Manchuria took approximately one third. America is another big user, purchasing timber to the value of 960,000 Yen in 1914. England, Belgium, Germany, Austria and Egypt are among the other heavy purchasers. The following table gives the returns of exports from Hokkaido for 1913 and 1914:

Destination.	1913 Yen	1914 Yen
China	2,196,351.00	1,988,636.00
Manchuria	631,110.00	744,443.00
Hongkong	14,344.00	9,512.00
India	148,259.00	62,713.00
British colony	6,228.00	25,035.00
Russia (Asiatic)	16,457.00	72.00
England	253,834.00	296,095.00

Hokkaido Lumberman's Camp

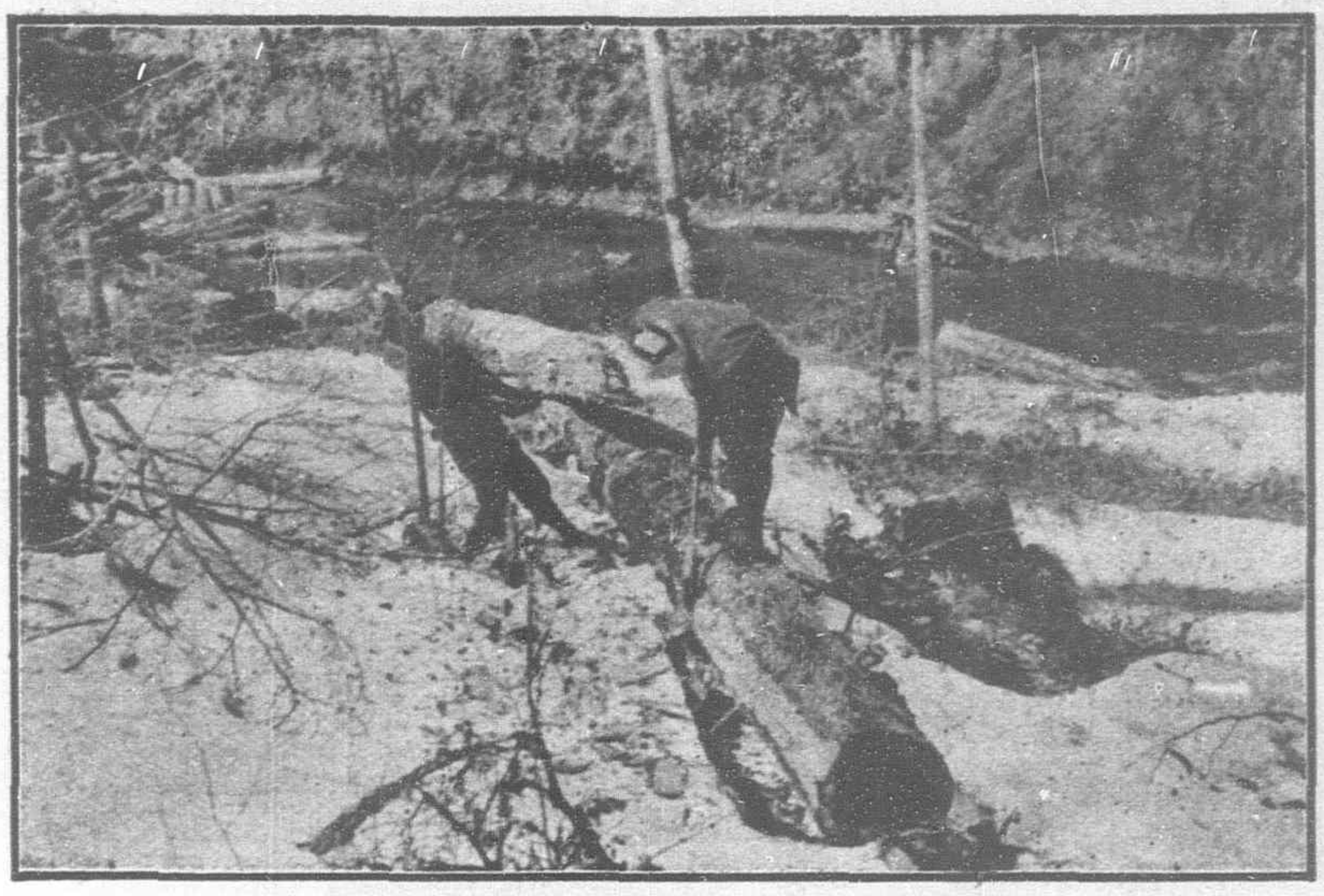
France	188,142.00	185,414.00
Germany	65,726.00	294,554.00
Belgium	388,294.00	757,940.00
Italy	———	9,827.00
Austro-Hungary	4,584.00	2,757.00
Netherlands	250,165.00	100,808.00
Denmark	85,357.00	22,363.00
America	874,801.00	960,306.00
Canada	54,928.00	41,792.00
Austria	474,530.00	494,708.00
Hawaii	23,942.00	15,015.00
Egypt	536,457.00	478,583.00
Other countries	38,887.00	28,647.00
Total	6,252,396.00	6,519,222.00

The development of the timber industry in Hokkaido for the export market has been comparatively recent, beginning between ten and fifteen years ago. Since then there has been a steady and rapid expansion of the industry and the establishment of logging camps and saw mills. There are now on the island nearly fifty saw mills, scattered throughout the forest area, many of them large mills with a capital from 100,000 Yen to a quarter of a million Yen. All of the export lumber leaves through the three open ports: Rushiro, Otaru and Mororan. While the complete figures are still unavailable it is estimated the exports for 1914, including square and round logs, sawn lumber and sleepers were, in round numbers, 44 million cubic feet. In 1913 the amount exported was 39,421,774; in 1912 32,011,427, and in 1911, 27,795,692 cubic feet.

Hokkaido's forest resources are distributed as follows: Government forest, those belonging to the Imperial Household, the official district forest areas, the experimental forests for the Imperial University and those owned by public institutions and private individuals. While an official survey shows that these forest areas are productive of approximately fifty varieties of timber, including both those of the temperate and frigid sylvan flora, 67 percent of the availabe timber for logs and sleepers consists of oak and pine. The remaining quantity, available for the same purpose, consists chiefly of the Japanese woods, *Yama*, used for furniture; *Sema*, used for sleepers, and *Katsura*. A glance at the following figures showing the available quantity of timber in 1913 still available for logs and sleepers, in each of the variously controlled districts, shows the immense resources of the forests as they stand at present:

Imperial Household: Pine, 170,792,000 cubic feet; oak, 65,764,000 cubic feet; other kinds, 101,305,000 cubic feet; total, 337,861,000 cubic feet.

Government forests: Pine, 442,771,000 cubic feet; oak, 143,027,000 cubic feet; other kinds, 202,688,000 cubic feet; total, 788,486,000 cubic feet.



Japanese Lumbermen Sawing and Barking Log

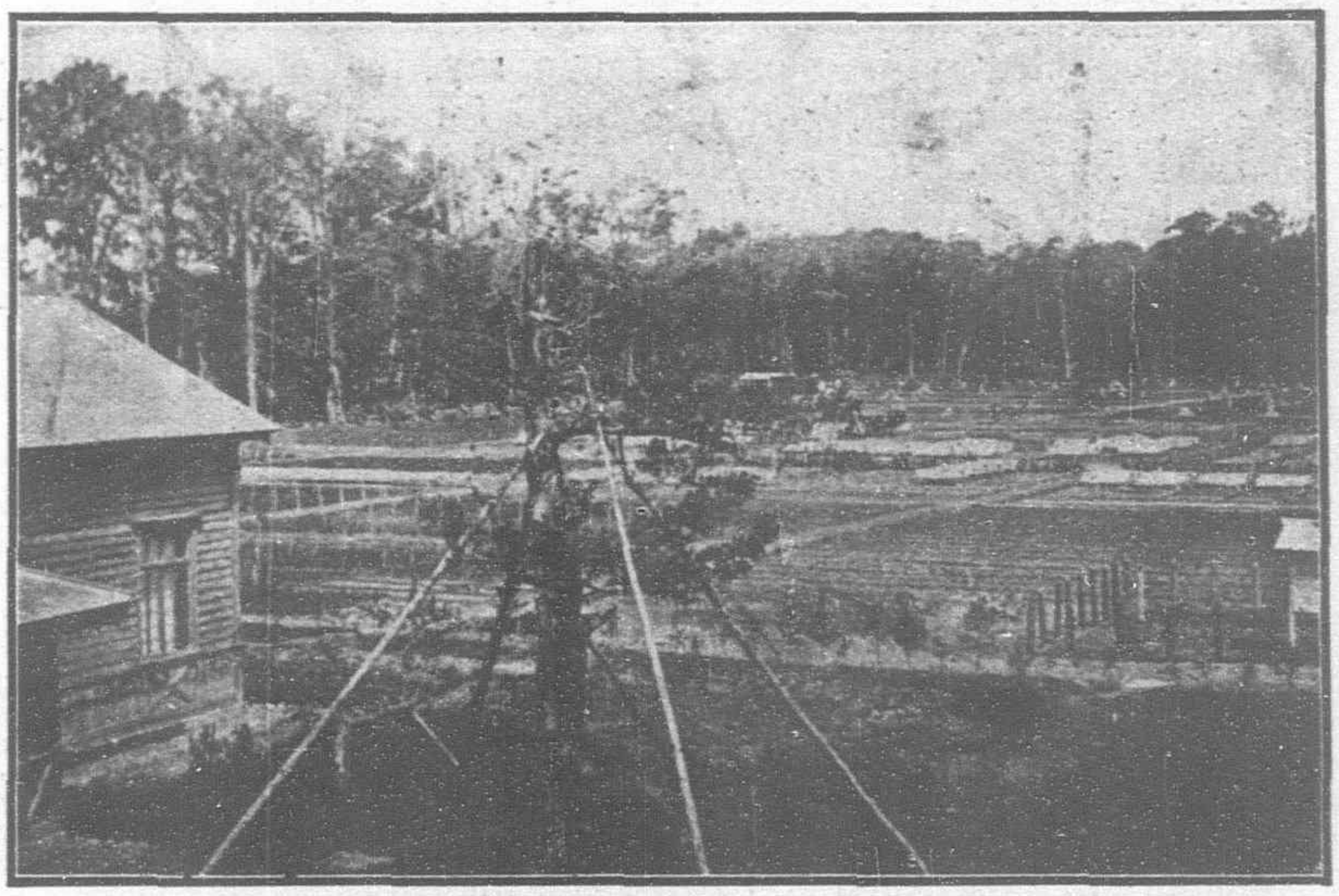
Official districts: Pine, 19,219,000 cubic feet; oak, 8,771,000 cubic feet; other kinds, 11,782,000 cubic feet; total, 39,722,000 cubic feet.

Imperial University experimental forests: Pine, 15,000,000 cubic feet; oak, 3,800,000 cubic feet; other kinds, 12,550,000 cubic feet; total, 31,350,000.

Owned by public institutions and private persons: Pine, 30,000,000 cubic feet; oak, 10,000,000 cubic feet; other kinds, 29,000,000 cubic feet, total, 69,000,000 cubic feet.

Thus it is seen that these resources total 1,266,419,000 cubic feet. The amount of oak totals 231,360,000, the amount of pine 677,780,000 and the other kinds 231,360,000 cubic feet.

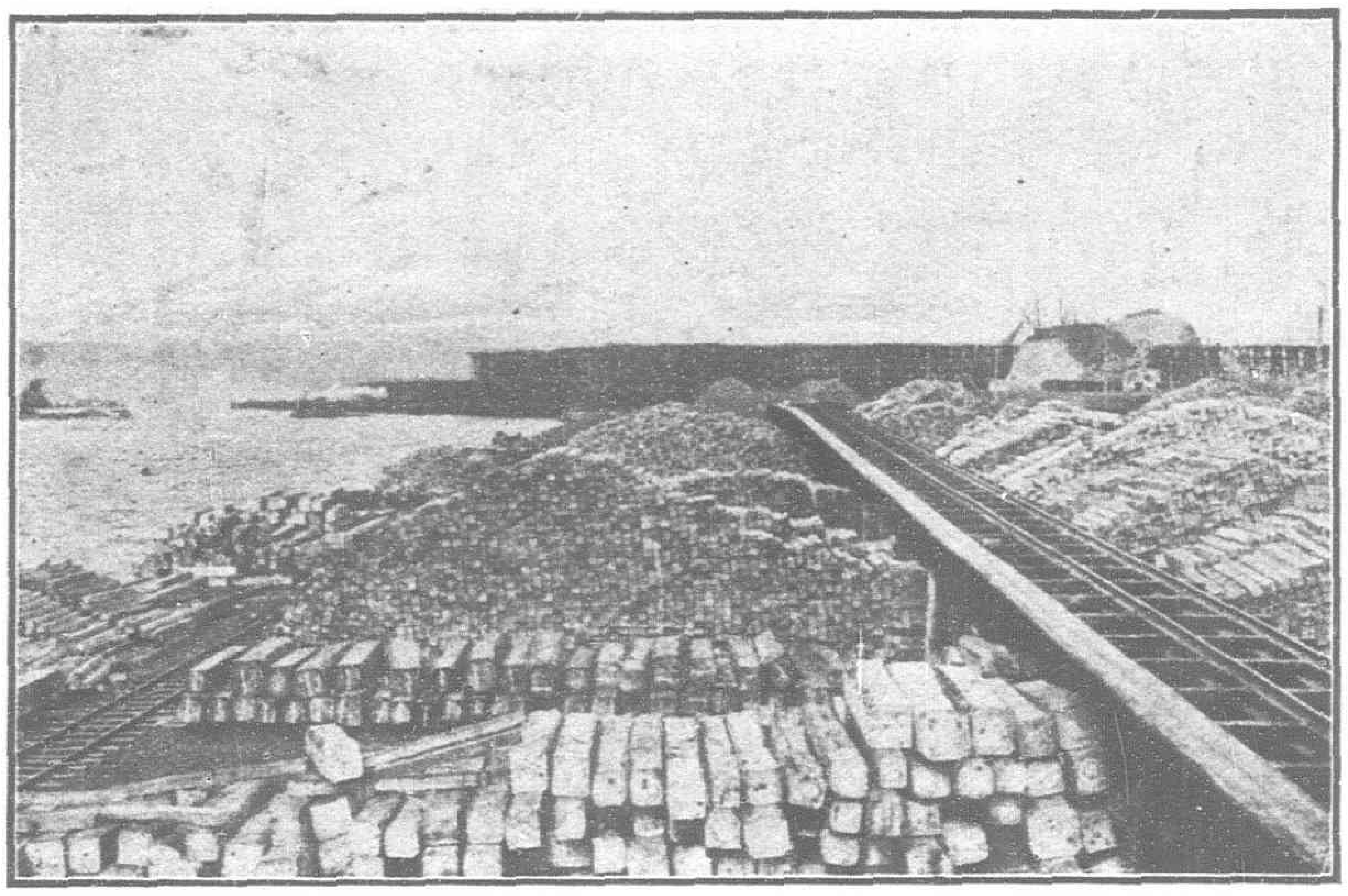
In addition to the owners of forests already mentioned there are some areas owned by temples and shrines, local governments and others. The figures given below shows the distribution of ownership of Hokkaido's entire forest land:



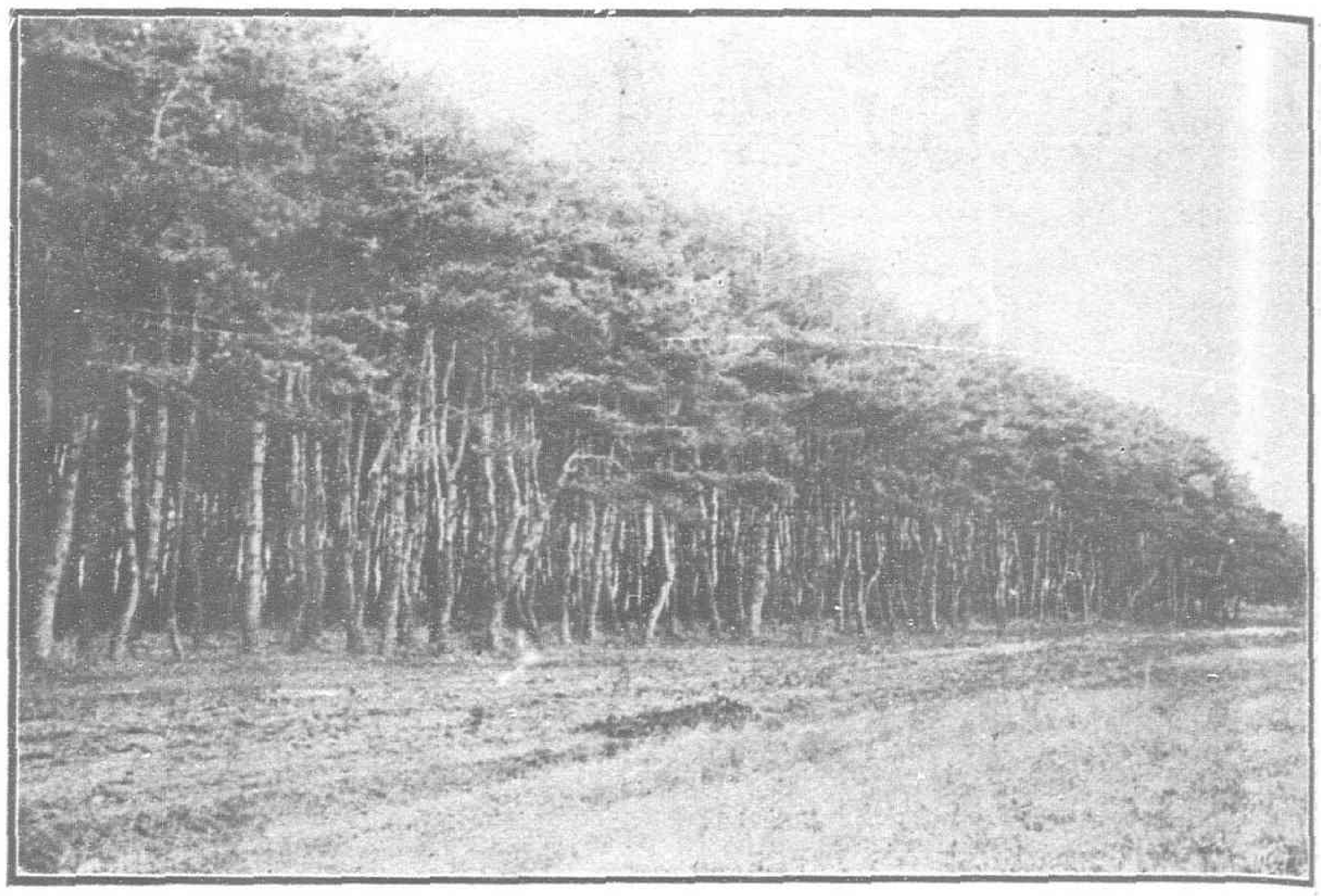
Nohoro Forestry Experiment Grounds in Hokkaido

Owners	Area
Forest belonging to the Imperial Household......	610,000 cho
Government Forest	3,674,000 cho
Experimental Forest for the Imperial University.	99,395 cho
Forest Owned by Local Office in Hokkaido......	188,737 cho
Forest Owned by Hokkaido Government	93,836 cho
Forest owned by Shrines and Temples	195 cho
Forest owned by Public Bodies	36,714 cho
Private Forest..............................	85,906 cho

It is interesting to note the exploitation and treatment that the Government has planned for the Hokkaido timber resources. All of the State Forests there, covering an area of 4,010,214 cho, are subject to the control of the Home Department, and the



Hokkaido Timber Waiting Shipment



Pine Afforestation at Yunokawa, Hokkaido

interests of the nation and public at large are taken into consideration, according to a well-defined high rotation system and the authorities are planting the most important varieties of trees. Beginning in 1908 as a continuation-work of ten years the government began a program, which in brief, includes:

(1) Disposing of such forests as are unfit for State ownership; (2) final survey of all forests retained; (3) perfecting plans for operation of those forests needing immediate attention; (4) planting open or deforested areas and starting nurseries; (5) improving rivers and roads for transport and establishing fire zones; (6) purchasing private forests wherever necessary. For completing this plan in Hokkaido and in Japan proper, an expenditure of 23 million Yen will be necessary. Since general ideas on the preservation of the timber resources have only recently taken hold in Japan there are only a few cases of the management and exploitation of the private forests. In particular the forests belonging to the religious establishments, such as the Shinto and Buddhist temples, are in a most ruinous condition.

Concerning the future of Japan's timber industry, a recent report compiled by the Bank of Japan, says that is very promising, especially in regard to the demand for telegraph poles and railway sleepers. It is only recently that the government has started on its own account in dealing in timber and wood, heretofore disposing of the trees as they stood. The government now has several yards in Hokkaido, but in many instances the inaccessibility of the state forests has proved a handicap to profitable marketing, the report adds.—*Messrs. Sale and Frazar's Greppo*

FOREIGN TRADE OF THE HOKKAIDO

The commerce of the Hokkaido* has developed rapidly during the past few years. Up to a comparatively late period its foreign trade was credited to Yokohama and Kobe, the bulk of the exports from the Hokkaido being shipped by coasting steamers to Yokohama and Kobe and thence to foreign countries and the imports being entered at the same ports and then reshipped to Hakodate, Otaru, Muroran, and Kushiro.

For some years past trade has been developing on more direct lines; in fact. two steamship companies had made arrangements for a regular monthly service from the Hokkaido to Europe when the war put a stop to this. With the restoration of peace there is no doubt that direct communication with Europe will be established. There is already a fairly frequent service between Hokkaido ports and the Pacific coast of the United States by the steamers of the Robert Dollar Co. and the China Import & Export Lumber Co., of Shanghai, whose steamers call at Hokkaido ports whenever sufficient cargo offers.

Exports from the Hokkaido are constantly increasing. Some 16 years ago a foreign firm in Hakodate tried the experiment of shipping oak logs to the Pacific coast. This business rapidly grew until at the present time about 8,000,000 cubic feet are annually exported to all parts of the world, and in addition to this various other hardwood timbers, as well as railway sleepers, veneers, etc., are shipped. These go to the United States, Chile, Australia, China, India, Egypt, Cape Colony, Spain, France, Great Britain, Holland, Belgium, Italy, and Germany, and the demand far exceeds the supply.

The demand for peas and beans also exceeds the supply, and they are raised in larger quantities every year and exports will soon be over 50,000 tons a year.

The adjacent waters teem with marine life. Herring and sardines are caught in vast numbers and turned into fertilizer and fish oil. The fertilizer is used in Japan, while the fish oil is exported to Europe. It was the practice in the past to ship this oil from the Hokkaido to Yokohama and Kobe, where it was strained, lightcolored vegetable oil's added (these being considerably cheaper than fish oil), and then exported. Of late years the direct export of fish oil has rapidly increased, the oil shipped from here not being mixed with vegetable oils and, although darker in color, being much preferred and commanding a higher price in Europe than the oil which has been handled in the southern ports.

The opening of the Panama Canal has given quite an impetus to the coal trade, and over 200,000 tons per annum are now shipped to Honolulu and used at that port for coaling ships that have come via the canal. The local fuel is of excellent quality. Sulphur and manganese are produced and shipped in large quantities; in fact for quite a number of years sulphur was the chief article of export from the Hokkaido.

The imports are principally agricultural and other machinery. The future of the island is agricultural. There is a rich natural soil, and very little artificial fertilizer will be required for some time to come. Manufactories are also springing up. There is an abundance of water power, and already several hydroelectric power plants are in operation, some of them with as much as 20,000 horsepower.

The Hokkaido's principal ports are Hakodate, Otaru, Kushiro, and Muroran. Hakodate has the finest natural harbor in Japan. The harbor in Otaru is protected by two large breakwaters, which make it safe and commodious. Kushiro was formerly little better than an open roadstead, but works now in course of construction will make this harbor one of the best in Japan. Kushiro will, in a few years, be the principal port for the export of cereals, being the natural shipping point for the rich and fertile Tokachi Valley. Muroran has a fine natural harbor.

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* Yezo, the most northerly of the large islands of Japan, forms, with its 12 adjacent islands and the Kurile Islands, a division of the Japanese Empire known as the Hokkaido. It is separated from the main island of Japan by the Strait of Tsugaru. Area, including the Kurile Islands, approximately 30,150 square miles.

THE PORT OF LUNGKOU

Lungkou is about 60 miles due west of Chefoo, on the west coast of the Shantung promontory. It lies about 100 miles southwest of the Japanese port, Dairen. Newchwang and Tientsin are each about 200 miles distant from Lungkou. The port is well sheltered by the Chiriutao Peninsula. It appears there is a narrow channel which admits of steamers of 12 feet draft anchoring within a few hundred yards of the shore; otherwise the port is shallow with a sand bar stretching out for considerable distance. The harbor of Lungkou (Dragon's Mouth) is 7 miles wide at the entrance and has a sand bar which forms a breakwater for 5 miles across the opening. The inner harbor, according to information, has a low-water mark of from 11 to 13 feet, and storms seldom disturb the shipping inside. The business of the port closes and opens each year with Tientsin and Newchwang, because the total business from other points does not at present require the attention of the foreign agent. The same irregular steamer which plies weekly between Chefoo and this port also touches at Tengchowfu, Tiger Head (off Laichowfu), and Yangkiakow. A large coolie traffic is carried on at Lungkow at the opening and closing of Newchwang. The town of Lungkou has a population of about 4,000. It is estimated that within a radius of 5 miles of Lungkou there is a population of 65,000. A level stretch of country behind Lungkou thickly populated and very fertile would make it appear that the port may some day assume considerable importance. The proposed Chefoo-Weihsien Railway would result in connecting Lungkou with both Chefoo and Weihsien, thus with north and central Shantung.

The opening of this port to foreign trade is due to overtures made to the Chinese Government by Japan. The waters about Lungkou abound in good fish, especially the "tai," which commands a splendid market in Japan. There is a large passenger trade between Shantung Province and Manchuria. Between 50,000 and 100,000 Shantung natives migrate to Manchuria each year for the summer crops, returning again in the fall or early winter. The Japanese at Dairen are desirous of controlling this passenger traffic and will be better able to do so through the opening of the port of Lungkou than otherwise. At present the bulk of this traffic goes from Chefoo and Tsingtau. As Dairen is but 120 miles from Lungkou, it will be possible to divert much of this passenger traffic to Lungkou, where Japanese steamers will probably be prepared to take it at a lower rate to Dairen than would be possible from Chefoo or Tsingtau, especially so when the railroad is completed connecting Lungkou with Weihsien.

Likewise will Japanese interests in Dairen be able through the port of Lungkou to share in the general import and export trade of Shantung in a far more extensive way than was possible under former conditions. It appears that Japan, with the opening of the port of Lungkou, is preparing to do everything possible to make the trade of that section of Shantung Province north of the German railway tributary to Dairen. Recently there was organized in Dairen with Japanese capital the Lungkou Bank, capitalized 100,000 yen ($49,800) to develop trade between Dairen and Lungkou. Japanese hucksters are to be seen going about the interior of the northern section of Shantung drumming up trade.

There is no feeling among the foreign merchants of Chefoo that the opening of Lungkou will greatly affect the trade of the port. It is not anticipated that any foreign interests other than the Japanese will avail themselves of the port. The construction of the proposed Chefoo-Weihsien Railway, along with the completion of the Chefoo breakwater, should result in making Chefoo an outlet for much of North China—that is, provided arrangements can be effected whereby this railway may be connected with the Tientsin-Pukow line. It is not to be expected that the Chinese Government will for many years at least undertake extensive harbor improvements at Lungkou. Without extensive harbor improvements Lungkou can not accommodate more than two or three vessels of 12 feet draft at one time at anything like a reasonable distance from the shore, so shipping men here testify. The opening of the port will materially assist Japanese interests at Dairen and help Japan to contest with Germany trade supremacy in northern Shantung.

EXPORT TRADE OF HONGKONG

In exports in general from Hongkong there has been some slackness in the demand for articles of luxury or ordinary use during the first 9 months of 1915. Shipments of tin to Great Britain, for example, increased from 2,444 slabs during 1914 to 26,476 slabs in the 1915 period; shipments to the continent of Europe decreased only from 20,392 to 17,843 slabs, while shipments to the United States and Canada increased from 22,704 to 46,127 slabs. The total shipments increased from 45,540 slabs in the 1914 period to 90,446 slabs for the 1915 period. These slabs weigh 112 pounds each.

Shipments of matting to Great Britain during the nine months increased from 24,823 to 40,994 rolls, those to continental Europe decreased from 80,176 to 14,771 rolls, and those to the United States and Canada decreased from 90,104 to 56,902 rolls. The total shipments decreased from 195,103 rolls for the 1914 period to 112,667 rolls for the 1915 period.

Exports of preserves, mostly ginger, to Great Britain decreased from 30,534 cases in the first nine months of 1914 to 26,298 cases in 1915; those to continental Europe from 4,741 to 763 cases; and those to the United States and Canada from 3,905 to 1,543 cases. The total exports decreased from 39,180 to 28,604 cases.

Shipments of silk piece goods to Great Britain amounted to 180 cases as compared with 152 cases for the first nine months of 1914; shipments to continental Europe decreased from 234 to 140 cases, while shipments to the United States and Canada decreased from 604 to 260 cases. Exports of waste silk to Great Britain amounted to 8,191 bales compared with 7,630 bales in 1914; those to continental Europe fell from 9,104 to 1,212 bales, and those to the United States and Canada increased from 5,163 to 13,482 bales. The total exports decreased from 22,458 bales for the 1914 period to 22,324 bales for the 1915 period.

Exports of cassia to Great Britain increased from 2,335 to 12,800 cases; those to continental Europe decreased from 59,976 to 14,310 cases, and shipments to the United States and Canada increased from 33,114 to 44,957 cases. The total exports decreased from 95,425 to 72,067 cases.

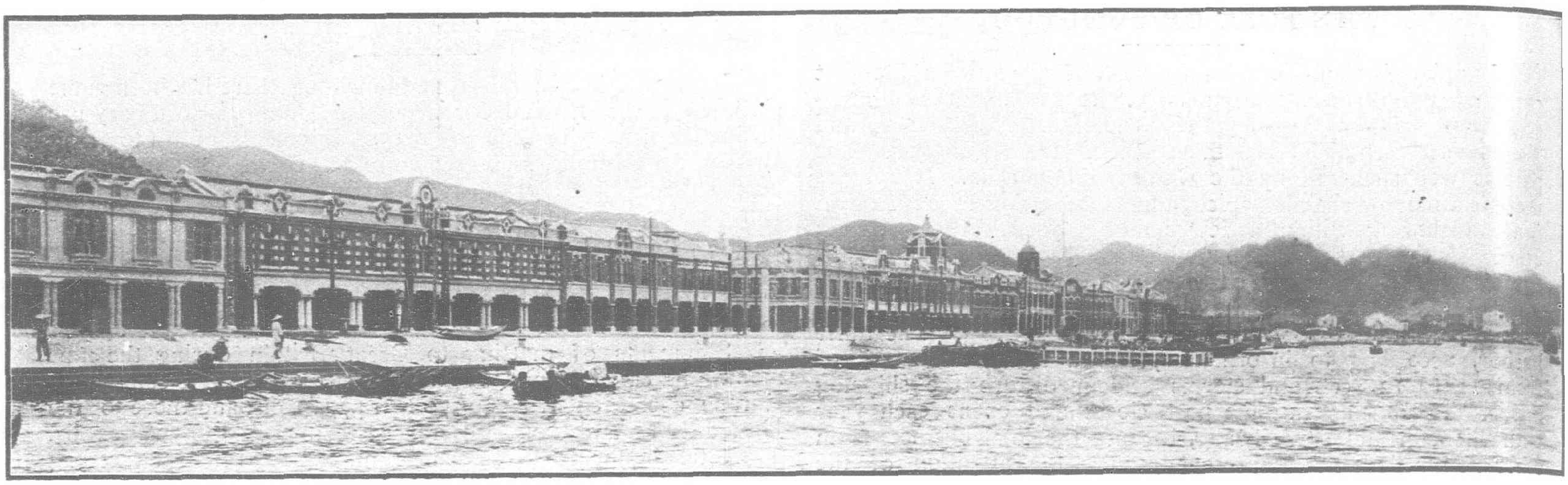
There were increased shipments generally of soy, essential oils, bristles, gunny bags, and rattan and rattan ware, particularly to the United States. There were decreases in exports of canes, chinaware, human hair, feathers, hemp, firecrackers, tea, nut oil, and most miscellaneous Chinese produce.

WORLD'S COTTON SHORTAGE

The total area and yield of cotton reported from India in 1915 shows a falling off of 27 per cent from the 1914 crop according to the final estimate issued by the Directorate of Statistics on March 3. The total area reported is 17,967,000 acres or 6,628,000 acres less than last year. The total estimated yield is 3,819,000 bales of 400 pounds each while the 1914 yield was 5,209,000 bales. According to the International Institute of Agriculture in a report issued at Rome last month, the United States also will have a decreased yield, which may act in sympathy with the shortage in India and Egypt, to bring about a large increase in prices.

The yield in the United States will be some 10,640,000 bales of 500 pounds each as against 16,080,000 bales in 1914, a decrease of 5,440,000 bales. That of Egypt is 1,200,000 bales against 1,700,000 last year. Reducing the bale yields to pounds it will be found that the total output of cotton from the three countries in question will be 3,486 millions of pounds less than in 1914.

Accurate figures on the Chinese cotton crop are unobtainable, while those for Russia are not yet at hand although the prospects for the Russian crop are said to be good. The Russian acreage and yield also are believed to have suffered a huge shrinkage.



THE BUND AT KEELUNG

TAIWAN (FORMOSA) AND ITS EXPOSITION

On April 10, the Formosan Government will open an exposition to which it has invited the world and by which it proposes to show to the world the advances that have been made in Formosa since the Japanese took over the Island at the close of the Sino-Japanese war in 1895, this being ceded to her in lieu of Liaotung Peninsula, which spoil of war she was prevented from taking by the powers led by Russia, but later took it herself.

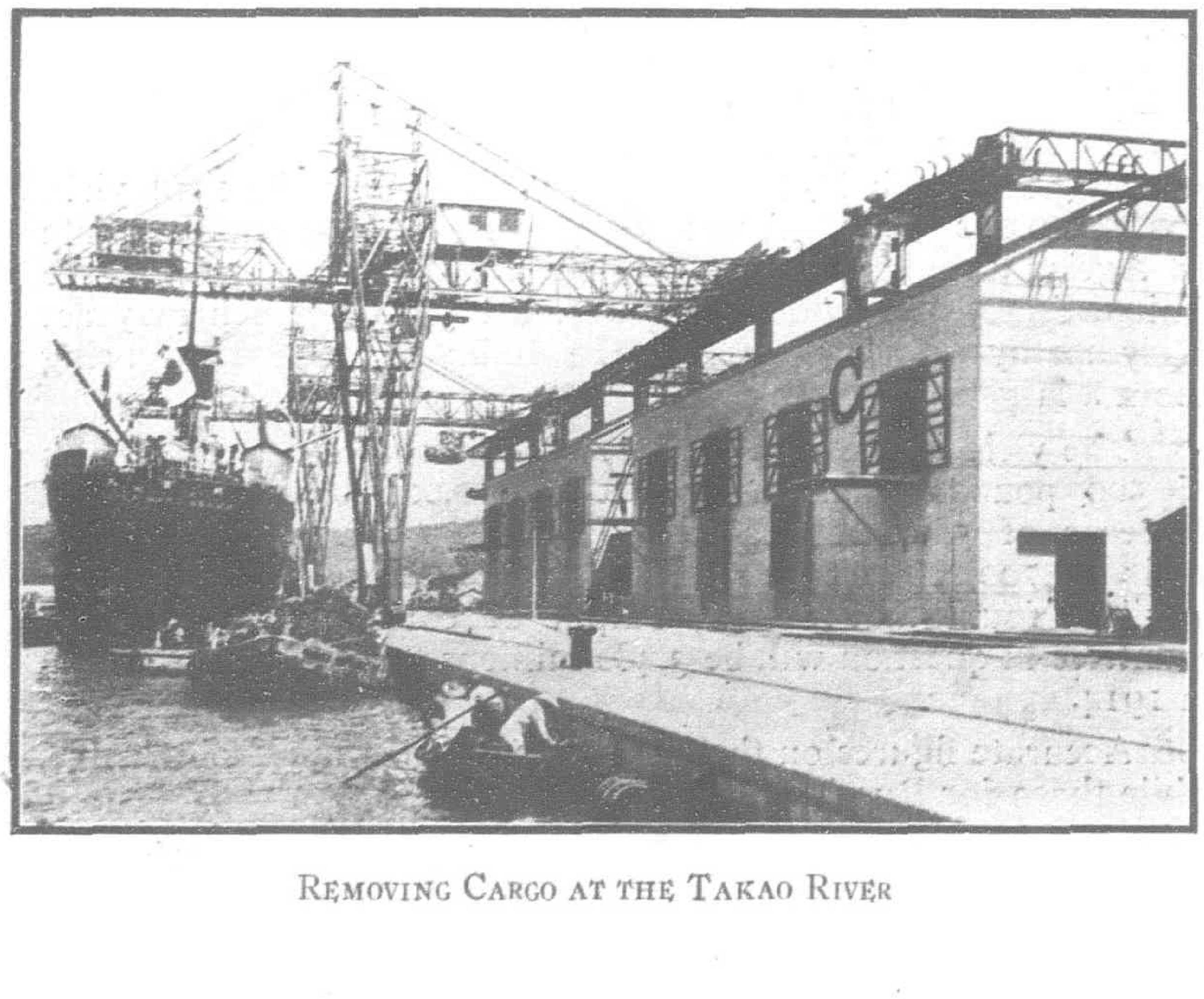
The reports of Formosa, or Taiwan as it is called by the Japanese, who have reverted to the ancient Chinese name, are issued for the most part in Japanese so that the outside world has had little opportunity to judge of the progress that has been made, and those who visit the exposition to view it with an understanding eye, will perceive at once the vast gulf that has been created between the Formosa of 1895 and the new Taiwan,—a hive of industry in which the slothful native has been compelled to mend his ways and conform to the Japanese idea of efficiency.

Taiwan's exposition will also be illuminating to those visitors from the United States, who have been of the opinion that even were the United States to withdraw from the Philippines, Japan would not care to occupy them since the Philippines have a warm climate and are unsuited to the Japanese, forgetting that the climate of Taiwan for the most part is identical with that of the Islands now enjoying the protection of the American flag, and which lie only a few degrees south of Taiwan.

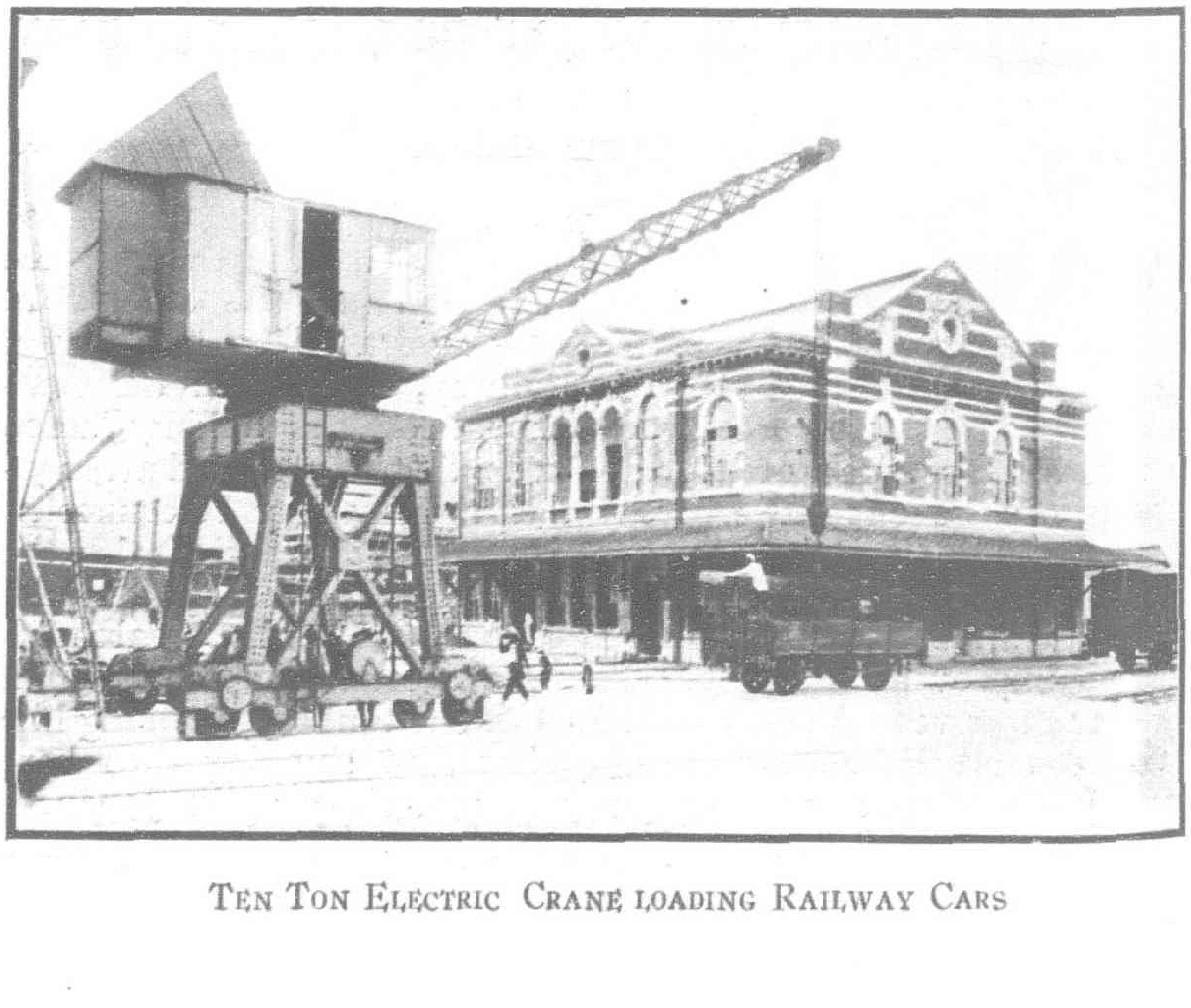
Japan has done her work thoroughly in Taiwan and has not been content to sit quietly as a collector of revenue at its ports, but at great expense both in money and men, has succeeded in bringing the Island to a productiveness that will seem marvellous when viewed by the Filipino or even by the American Administrators of the Philippines, some of whom we learn, will visit the Taiwan exposition. The following summary of the improvements inaugurated and carried through by the Japanese, therefore, should be read by Americans and Filipinos alike, with an eye to contrasts and comparisons, since the experience of the Japanese in Taiwan is similar in many respects to that of the Philippines.

As to the effect on the population of the relative systems of civilization and the methods of introducing them, the reader familiar with the work of the United States and the Philippines must draw his own conclusions, but the fact that upwards of five hundred Formosans have been executed for conspiracy within the past year, might well give the Filipino reason to pause and reflect as to whether he has been so harshly treated under American administration and whether he is really ready for the United States to withdraw, giving him a chance at independence, which might end in anarchy and subsequent Japanese occupation of the Islands.

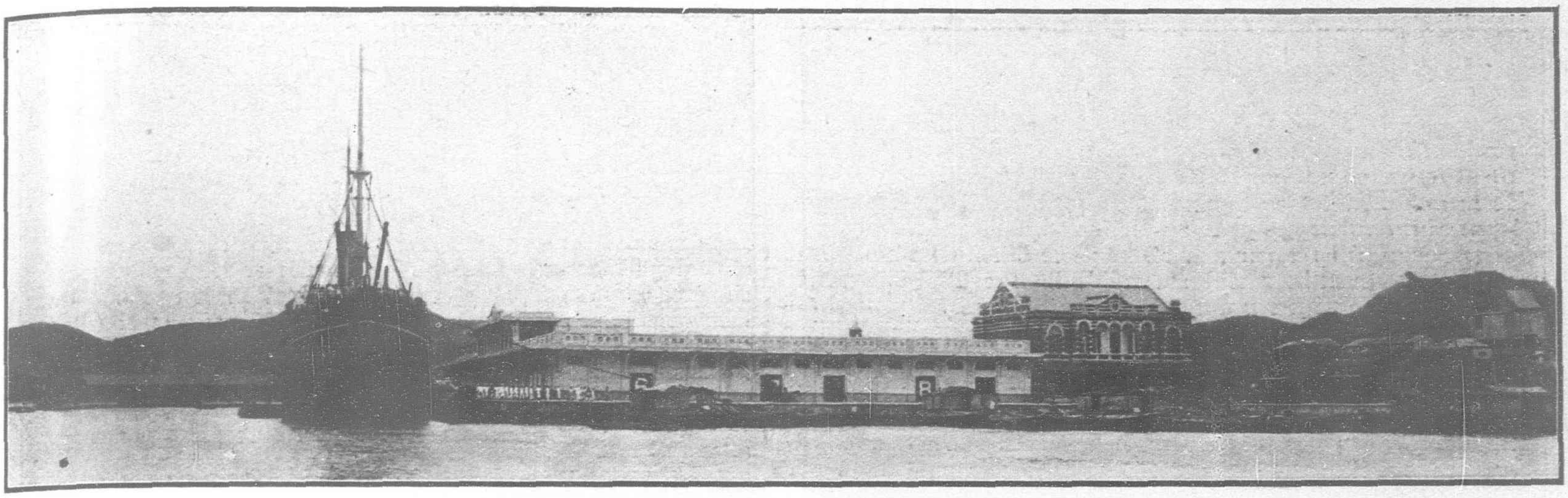
The purpose of this article, however, is not to call attention to possibilities, but to present actual facts and conditions as they are in Taiwan to-day after twenty years of Japanese occupation, and it must be said that the difficulties met by Japan in this island,



REMOVING CARGO AT THE TAKAO RIVER



TEN TON ELECTRIC CRANE LOADING RAILWAY CARS



THE FIRST MODEL WAREHOUSE BUILDING AT KEELUNG

the greater part of whose area is mountain and forest, have been much greater than those met by the Americans in the Philippines, barring the years of the Philippine Insurrection, since even to-day the Japanese are not in complete occupation of Taiwan, but are compelled to wage a systematic and increasing warfare against the wild tribes of the mountain heights. The following facts and figures regarding Taiwan and its people have been translated from Japanese reports regarding the progress of the Island:

Orography of Taiwan

Taiwan is the general name for the main island of Taiwan, the Hoko-to group (the Pescadores) and the adjacent islands. It is situated between 21° 45′ and 25° 38′ N. Latitude and between 120° 2′ and 122° 6′ E. Longitude. It has a circumference of 398 ri (1 ri=2½ miles), and an area of 2,332 sq. ri, being nearly equal to the island of Kyushu. The main island is oblong, stretching from north to south, with mountain ranges extending throughout its length. These mountains constitute a watershed, sending short rivers to the east and the west. These rivers have rapid currents and wide beds, and as they are fed by numerous tributaries, they afford great facilities for irrigation. The soil is rich, bearing annually two crops of rice. Of the mountains several are over 10,000 ft. high, such, for instance, as Niitaka Yama, Gundai San, Sylvia San, Tandai San, Zensan, and Kwanzan. Among these the Niitaka is the highest, being 13,020 ft. above sea level. On the plains are found wide stretches of rich cultivated fields, while the mountains are covered with primeval forests, shielding natural resources of great value.

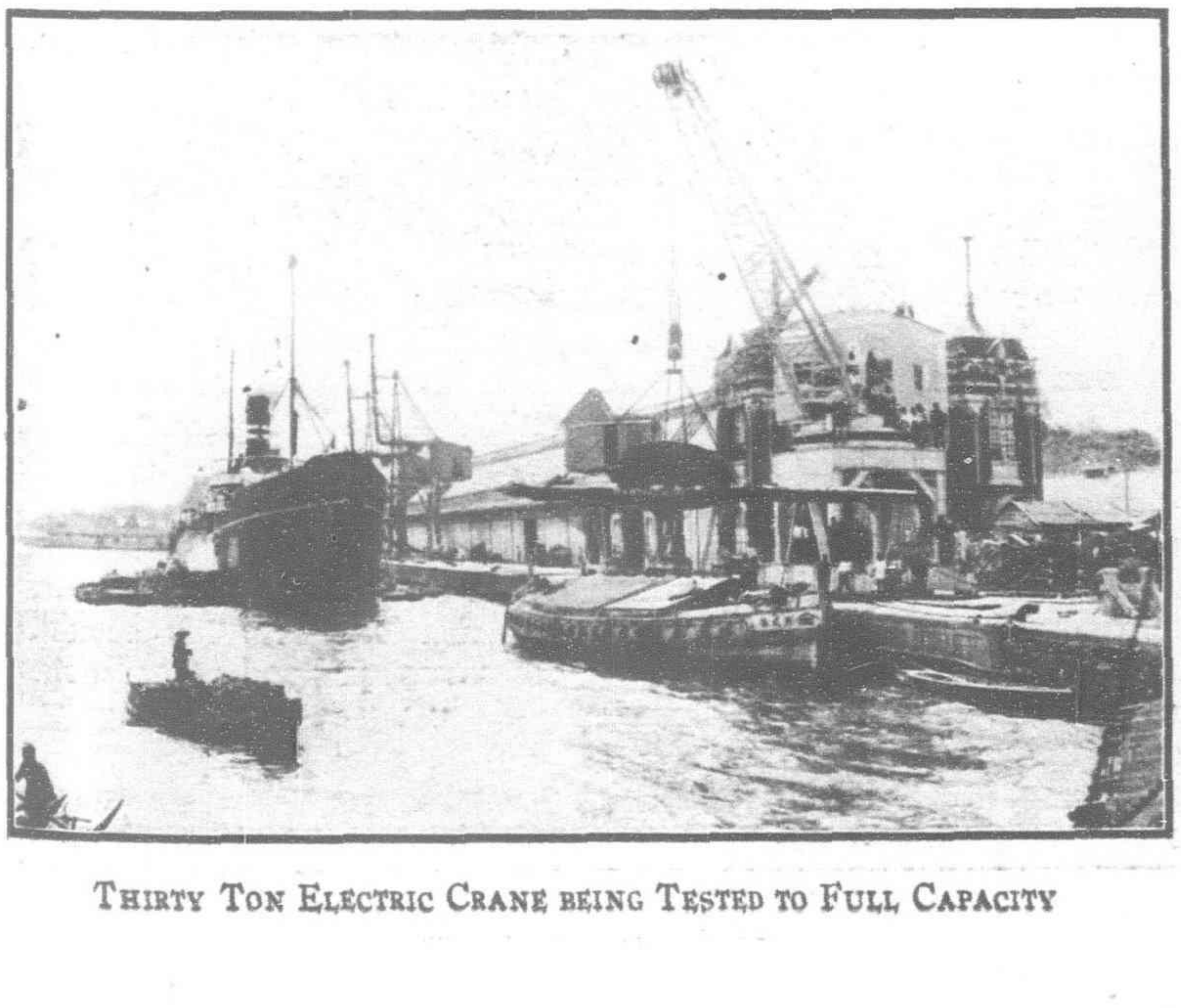
On January 1, 1914, the taxable lands amounted to 661,309 ko (Ko =2½ acres), yielding taxes of 3,083,118 yen, non-taxable lands to 137,511 ko, uncultivated lands exempted from taxation to 92,161 ko, and newly reclaimed lands exempted from taxation to 7,484 ko.

Irrigation, Reservoirs and Canals

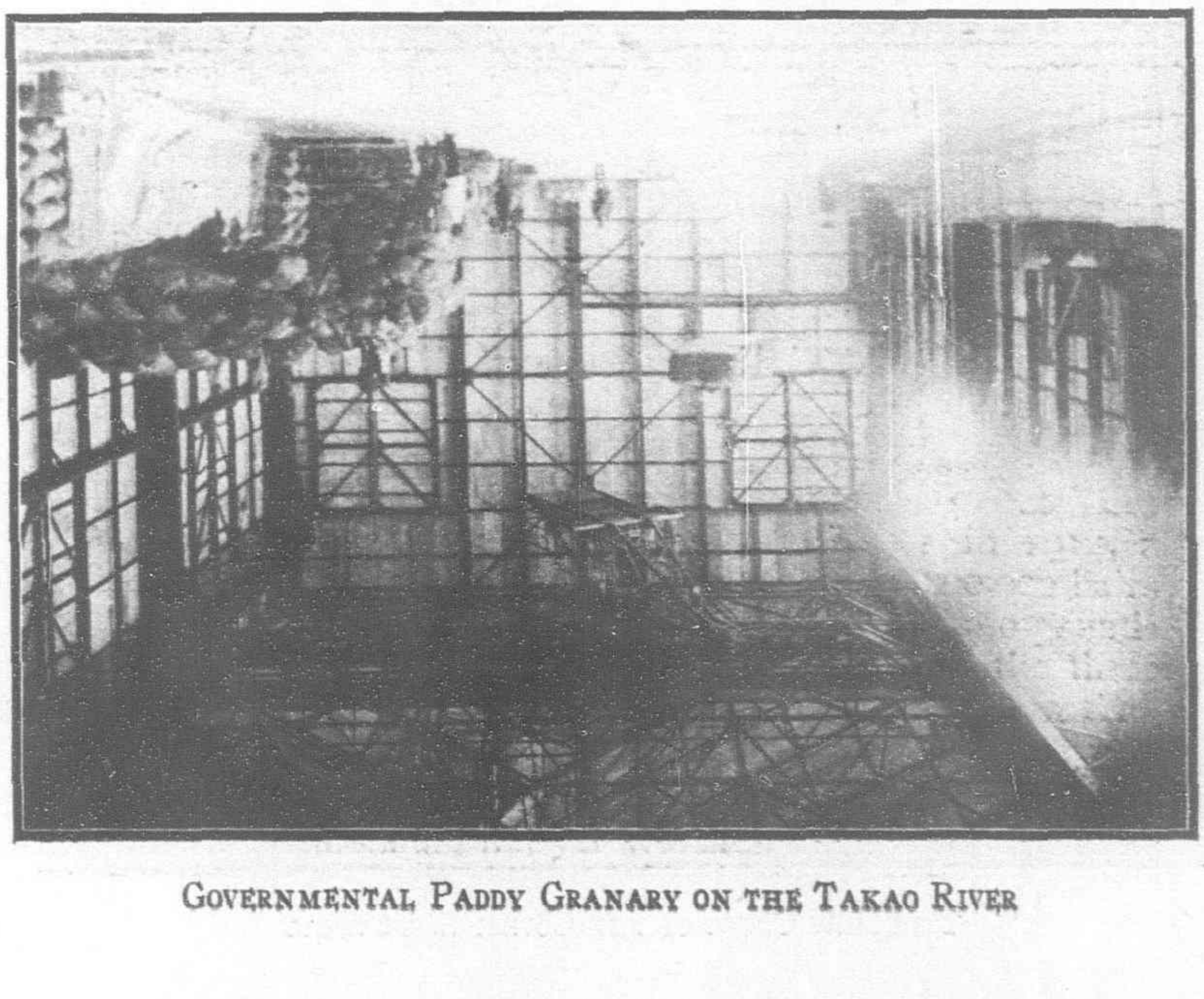
Taiwan possesses a highly developed system of irrigation, the oldest reservoirs and canals dating back two hundred years. Due to them the production of rice in Taiwan amounts annually to as much as four million koku of unhulled rice. The work of irrigation formerly was left to the private enterprise of individual farmers. To secure further extension and completion of the system the Government in 1901 assumed supervision over the management of irrigation works intimately connected with the interests of the public in general, and in 1914 there were 180 of them, irrigating a cultivated area of 239,082 ko from which the revenue is Y1,181,103. The Government in 1909 adopted a plan of government irrigation works, involving the disbursement of 20,000,000 yen spread over thirteen successive years, in which fourteen irrigation works are being constructed, to irrigate 118,000 ko of lands. The water power at the upper portion of the canals will be utilized for generating electricity to be conducted to important cities and towns of the island for lighting as well as for supplying power. Shishihto, Kori and three other places are included in the scheme whereby streams will be utilized for power besides serving the primary object of irrigation. When the scheme is fully completed it is expected that 10,750 H. P. of electricity will be generated.

Forests and Wild Lands

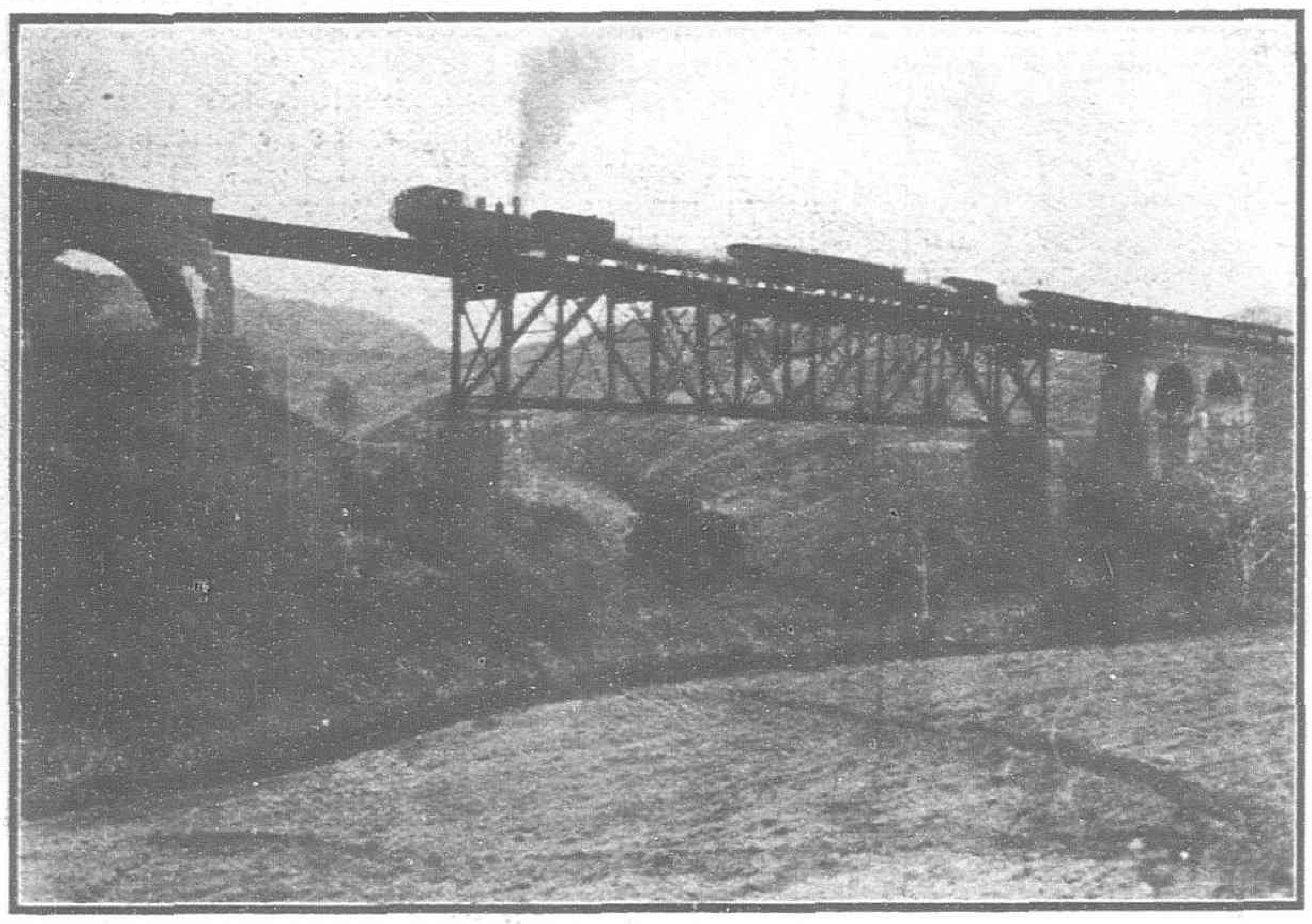
Taiwan is rich in forests, but no accurate statistics of the area covered by forests and wild lands on their borders are obtainable as yet, although a fairly reliable estimate puts the



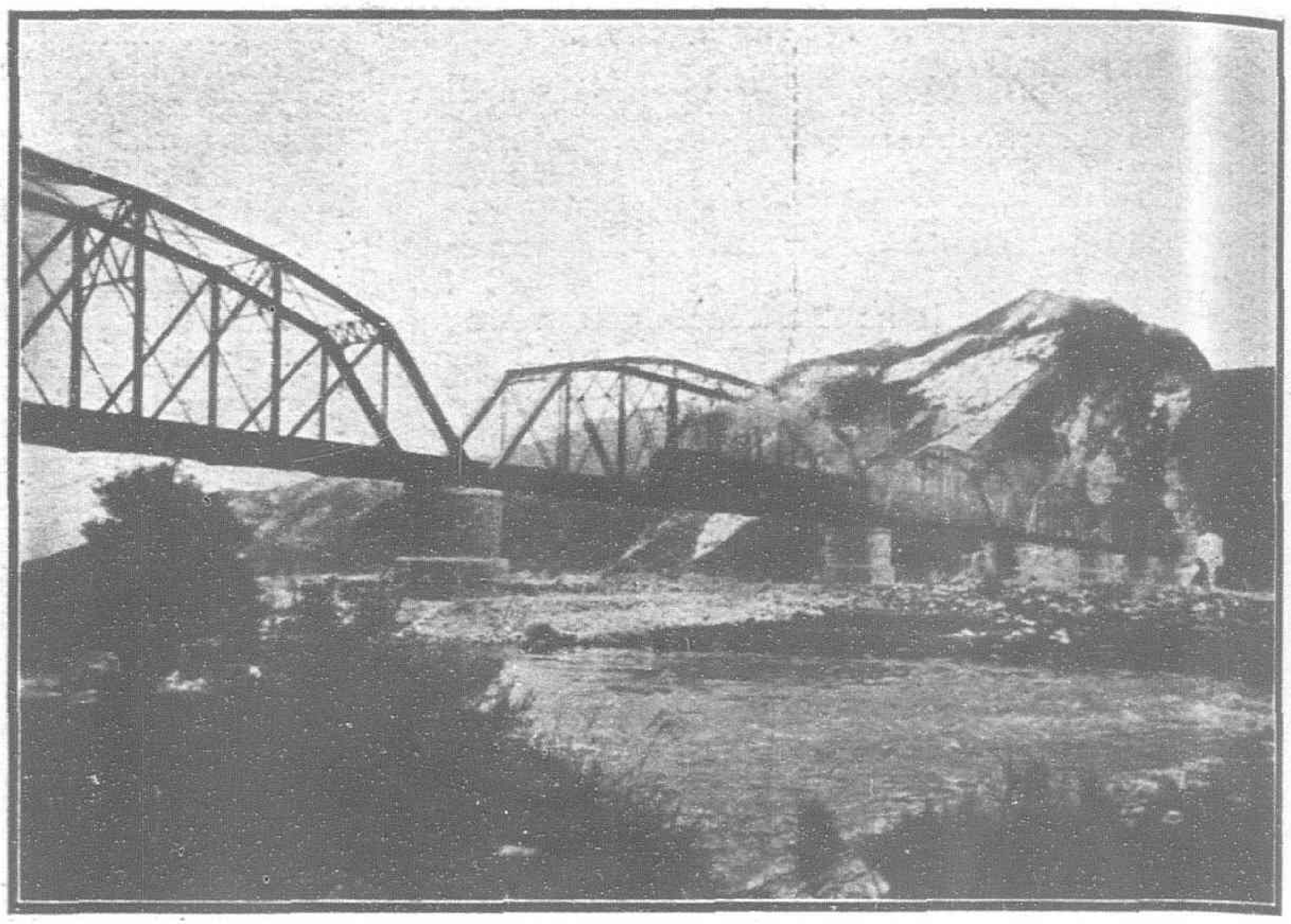
THIRTY TON ELECTRIC CRANE BEING TESTED TO FULL CAPACITY



GOVERNMENTAL PADDY GRANARY ON THE TAKAO RIVER



Yui Sung Peng Bridge

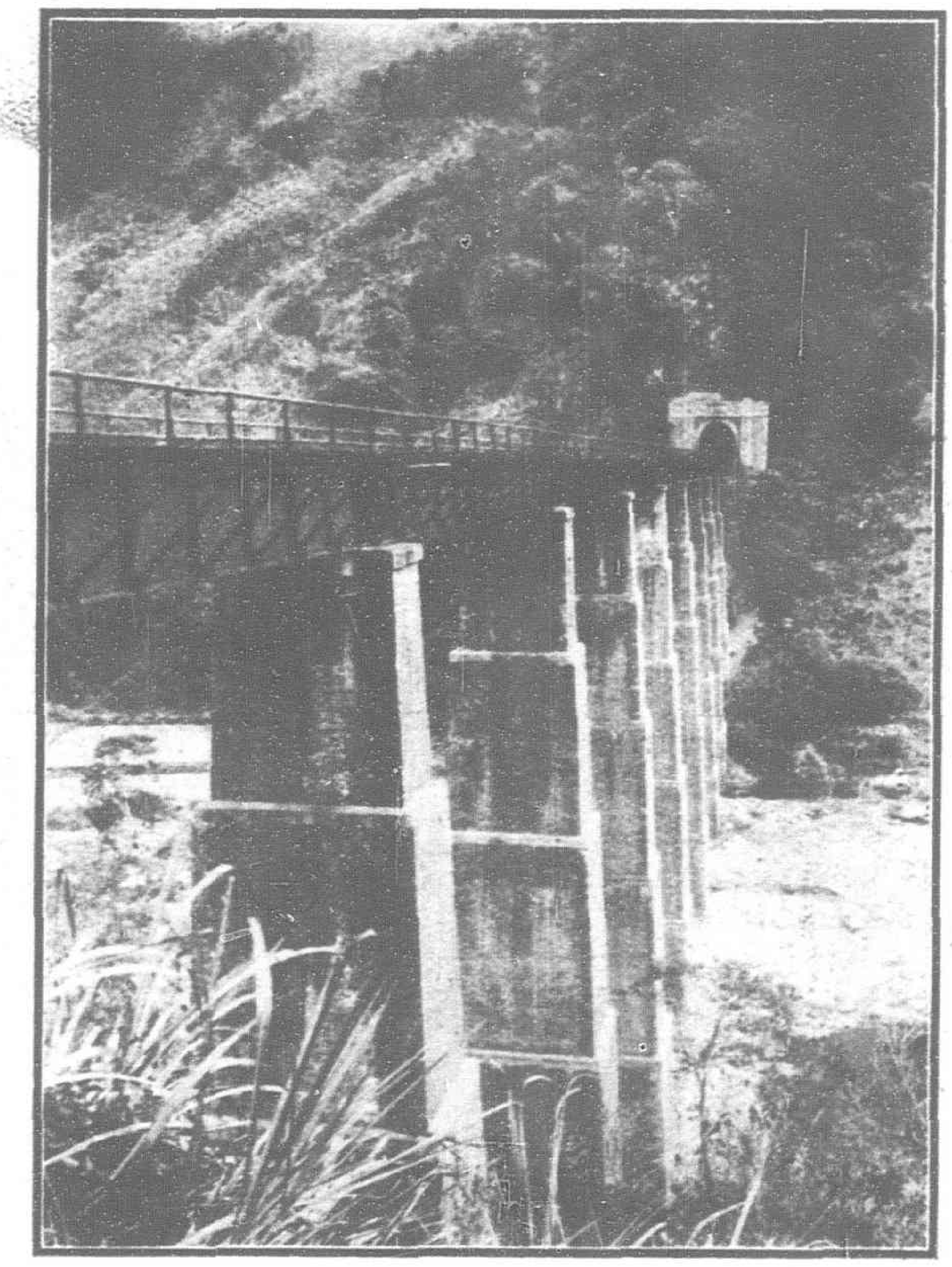


Ta Kak Chi Bridge

figures at 2,900,000 ko covering forest, wild lands and river beds traversing them. The forests of Taiwan comprise vegetations belonging to tropical, sub-tropical, temperate and even to semi-arctic climates. The forests in the civilised parts of the island under Chinese rule had been to a large extent cleared of trees, partly for agricultural purposes and partly from indiscriminate felling for timber and fuel. Of late years, however, the work of reforestation has been encouraged. The utilization of forests in Taiwan is still in a state of infancy. In the past the only use made of private owned forests has been the customary cutting of trees for fuel and timber for repair work. As for the official exploitation of forests, the camphor industry is the only enterprise worth mentioning.

The lease and sale of forests and wild lands is carried out under the Regulations for the Provisional Sale of Forests and Wild Lands, the total area disposed of thus up to the close of 1915 amounting to 55,000 ko. The total area of forest and wild lands either sold or transferred from the beginning of Japanese rule up to the end of 1915 amounted to about 126,800 ko.

The famous Arisan forests, which are being exploited by the Government of Taiwan, are situated within the savage land limits, and comprise a total area of 11,000 ko, containing timber estimated at 18,300,000 shaku-jima (Shaku-jima=1 cubic foot). These forests are found at altitudes ranging between 2,800 ft. and 8,700 ft. above sea level, and are reached by a forestry railway of 41 miles. The exploitation of these forests originally started as a private undertaking, was transferred to the Government through purchase in 1910.



Na Zeu Chuen Bridge

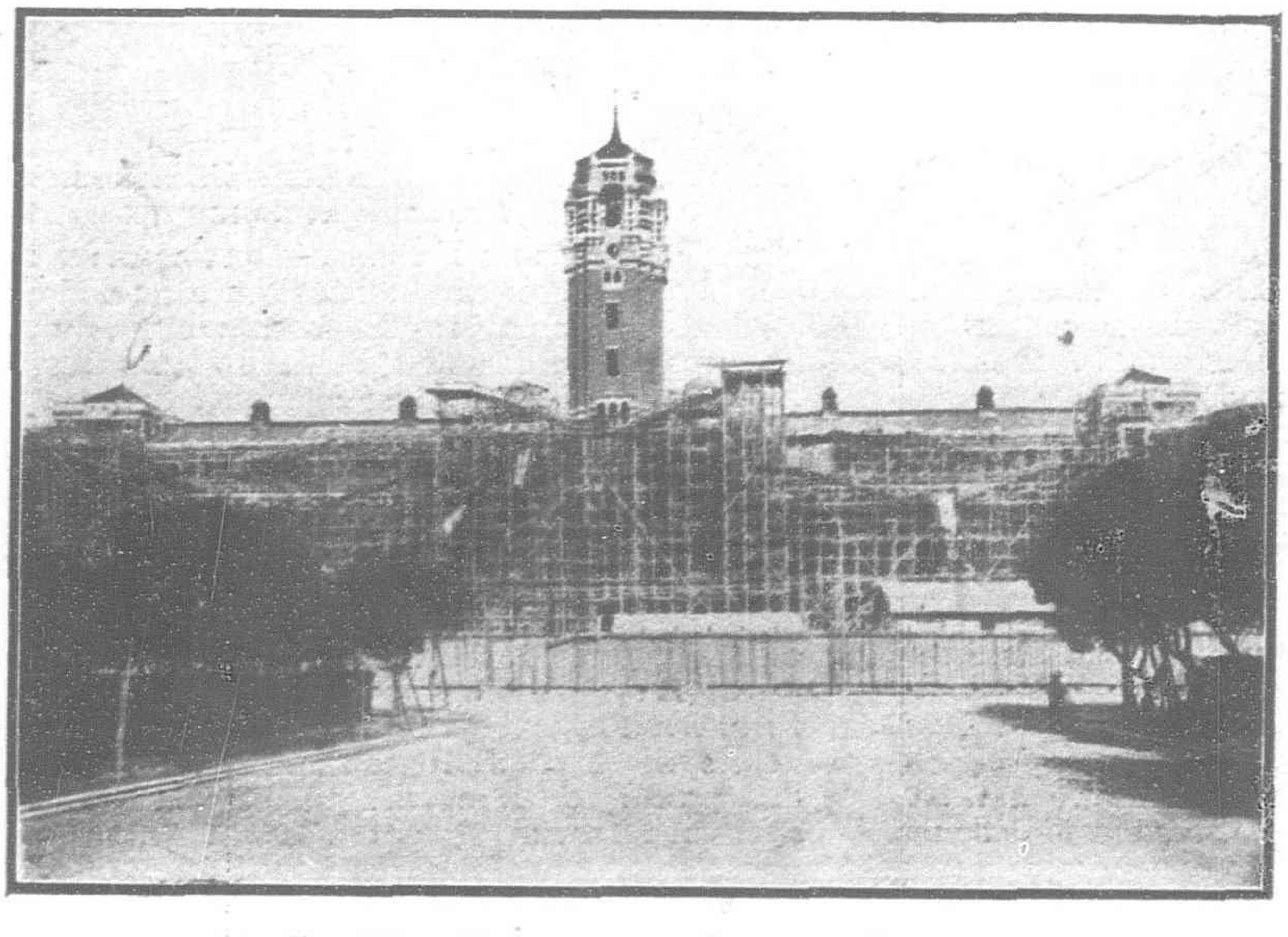
The forestry railway extends from Kagi Station to Nimanpei, Arisan. It is a mountain line, going up as high as 6,600 ft. above sea level, with a gauge of 2 ft. 6 in. and a greatest gradient of 1/20. The work of construction of the first section between Kagi and Jujiro, a distance of 34 miles, was commenced early in July, 1910.

Timber Felling

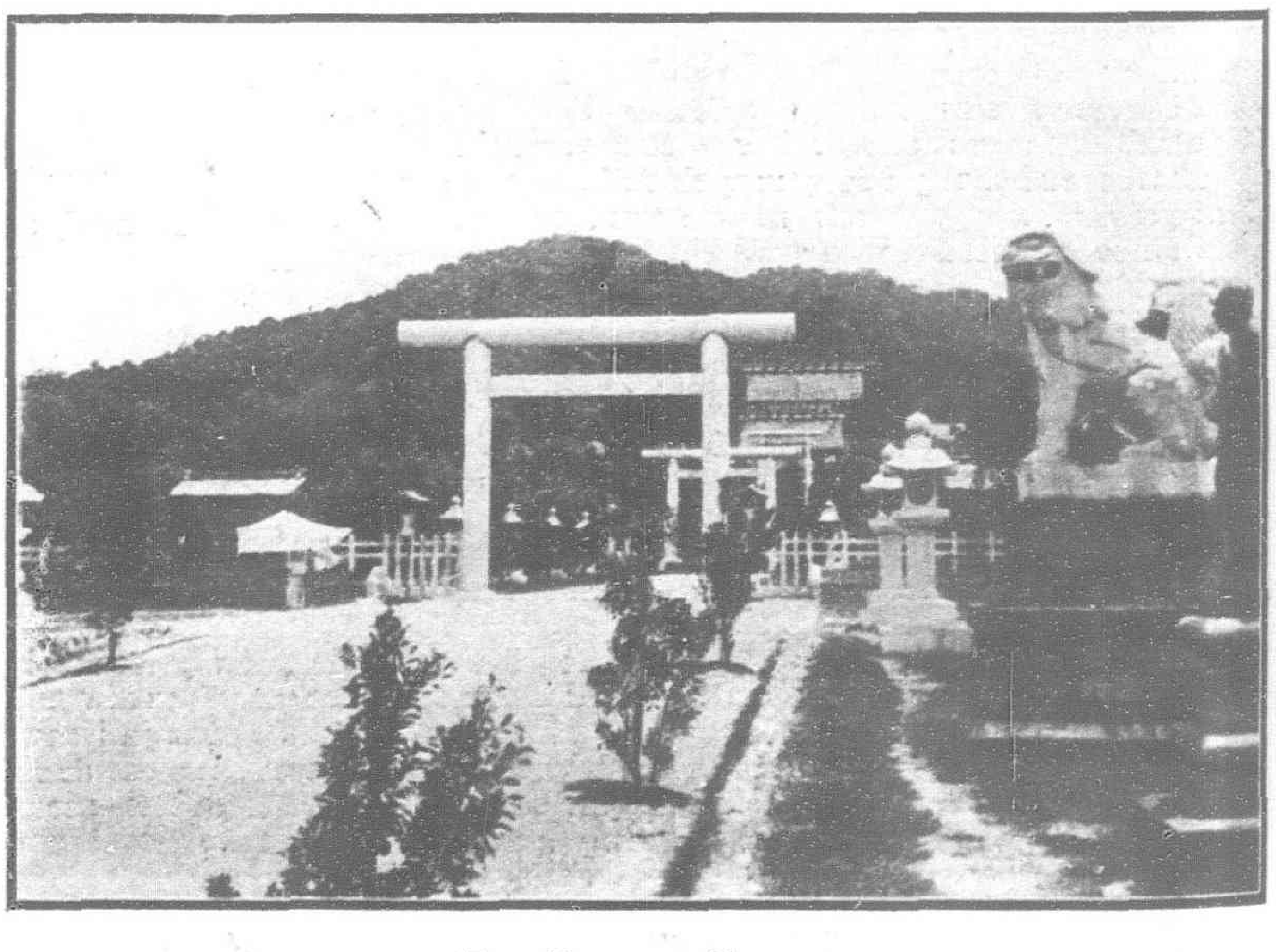
These primeval forests contain many old trees which should be felled as soon as possible, and the Government has adopted the plan of entirely renovating the Arisan forests in thirty-five years, by felling certain portions each year and reforesting them afterward. According to this plan the average felling each year will amount to 350,000 shaku-jima of timber.

The timber is brought to a convenient spot on suspended cables. From Nimanpei, the terminus of Kagi-Nimanpei Forestry Railway, a railway is being extended at the rate of two miles a year, to accord with the progress of felling trees.

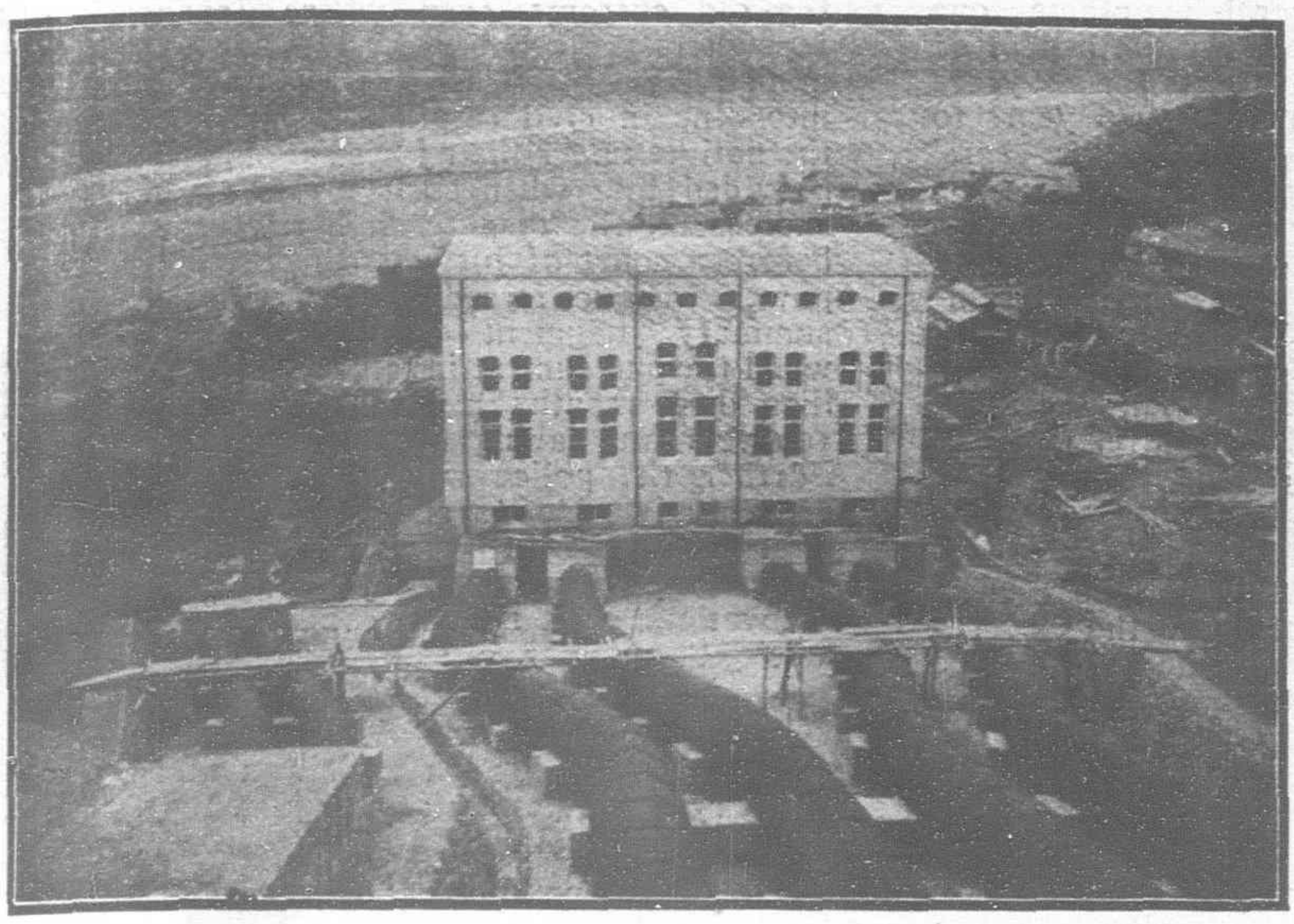
A saw mill has been built at the Kagi terminus of the forest railway using the latest improvements in machinery. In the choice of machinery and in arranging the mill yard, the object kept in view was the economy of labor in the handling of timber. This saw mill, running at full capacity, turns out annually 200,000 shaku-jima of prepared lumber. The



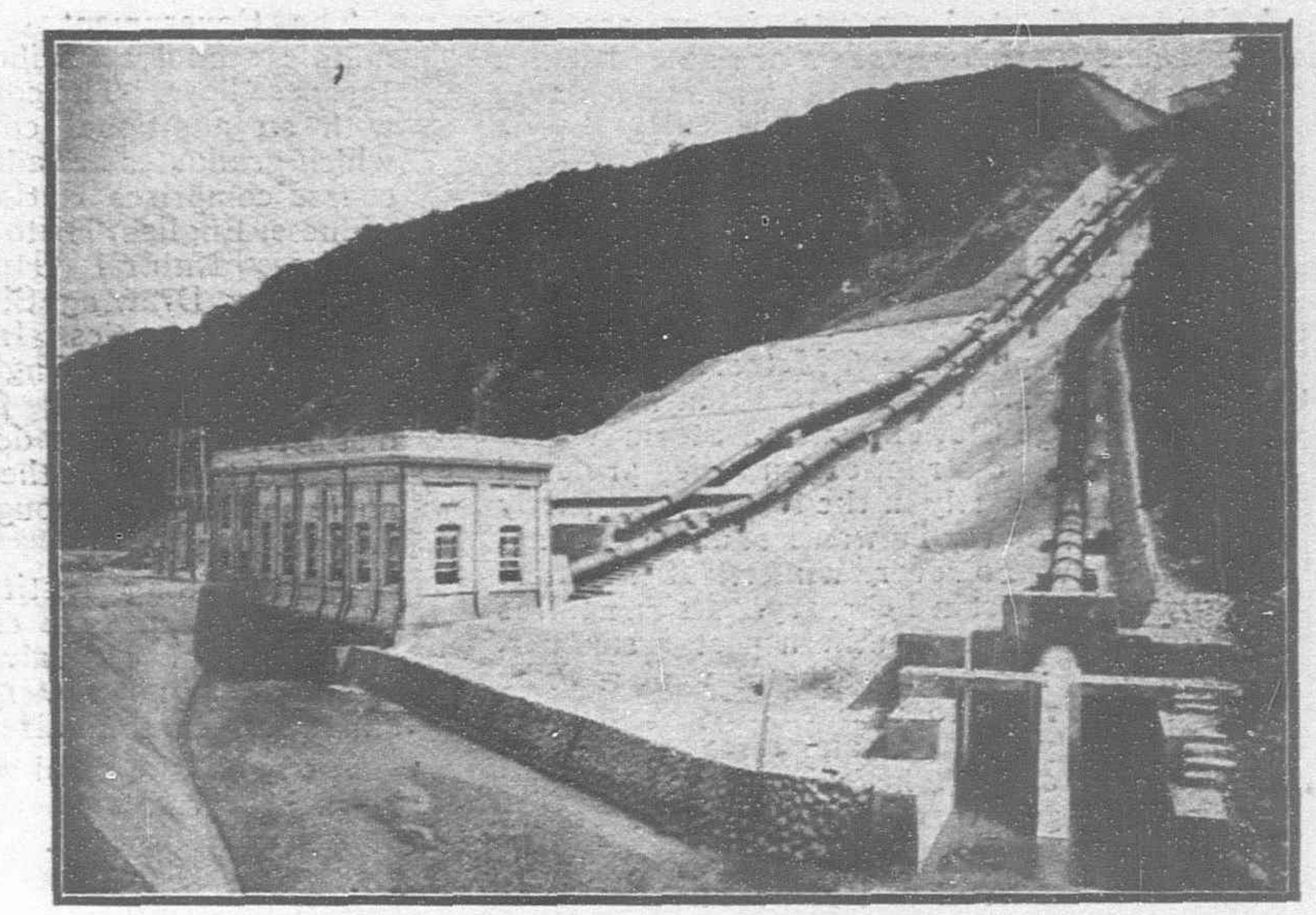
The New Court of the Governor General



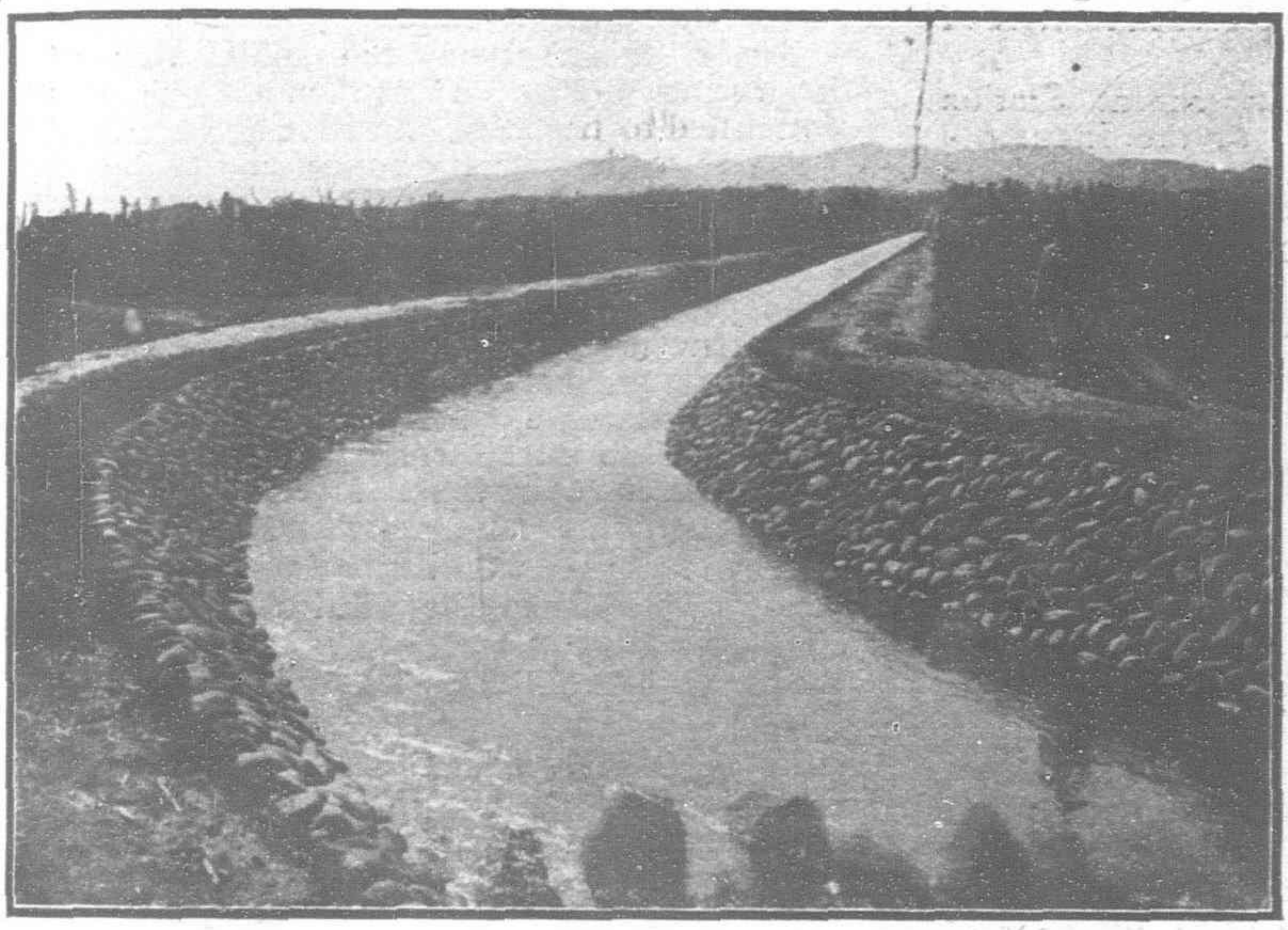
The Taihoko Temple



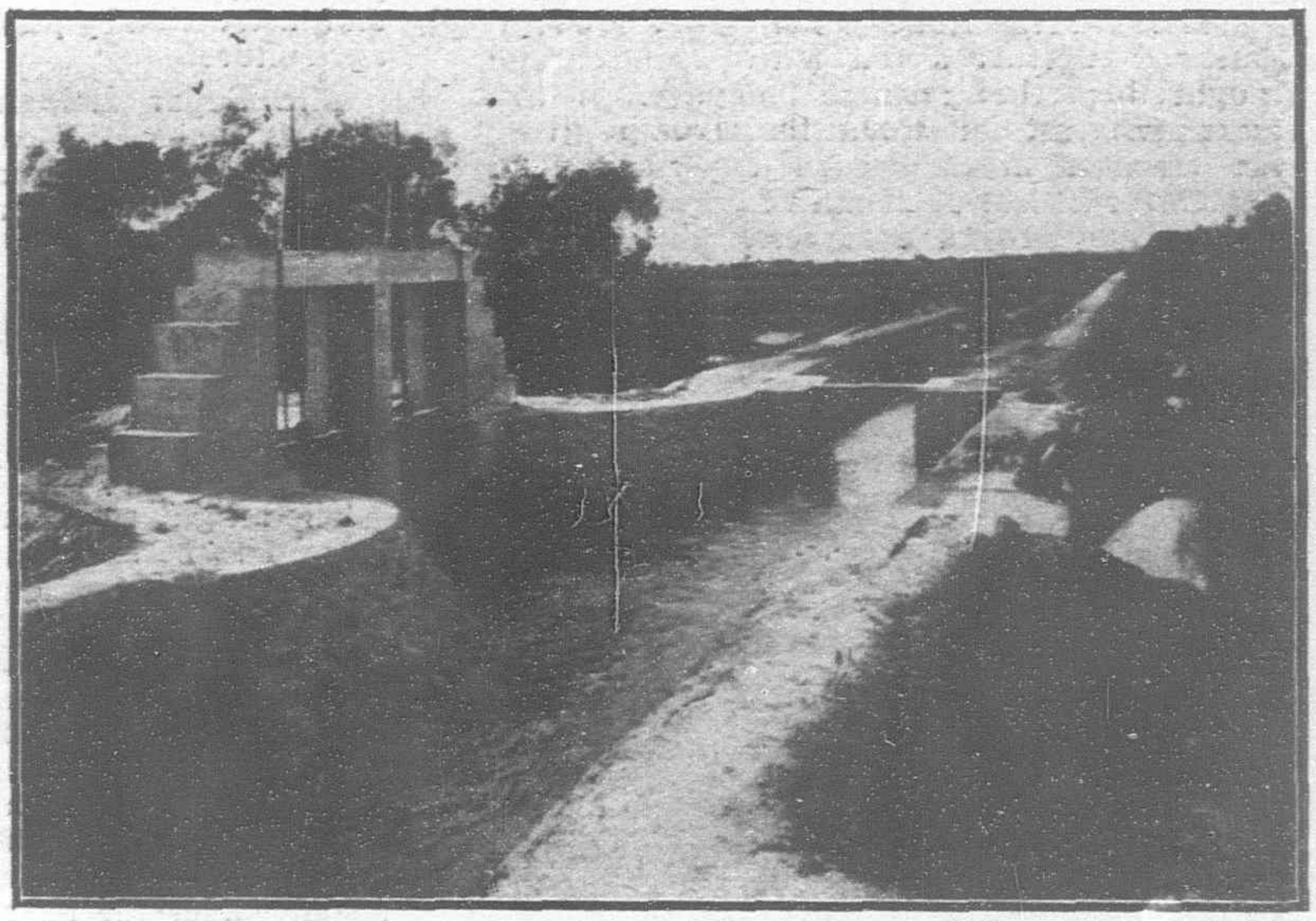
ELECTRIC LIGHT WORKS UNDER CONSTRUCTION AT LOH KWE LI



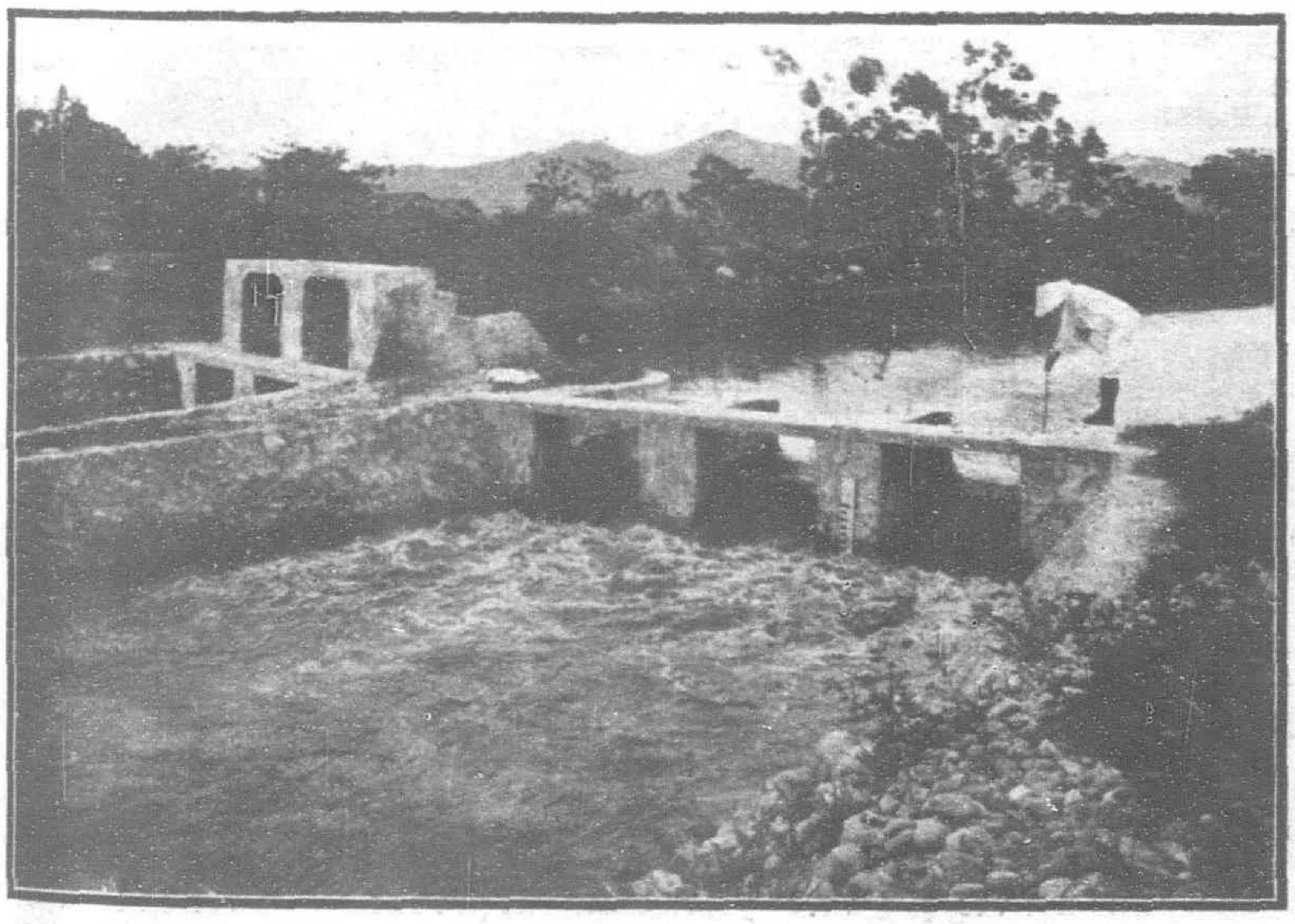
ELECTRIC LIGHT WORKS AT IEU LI ZEN



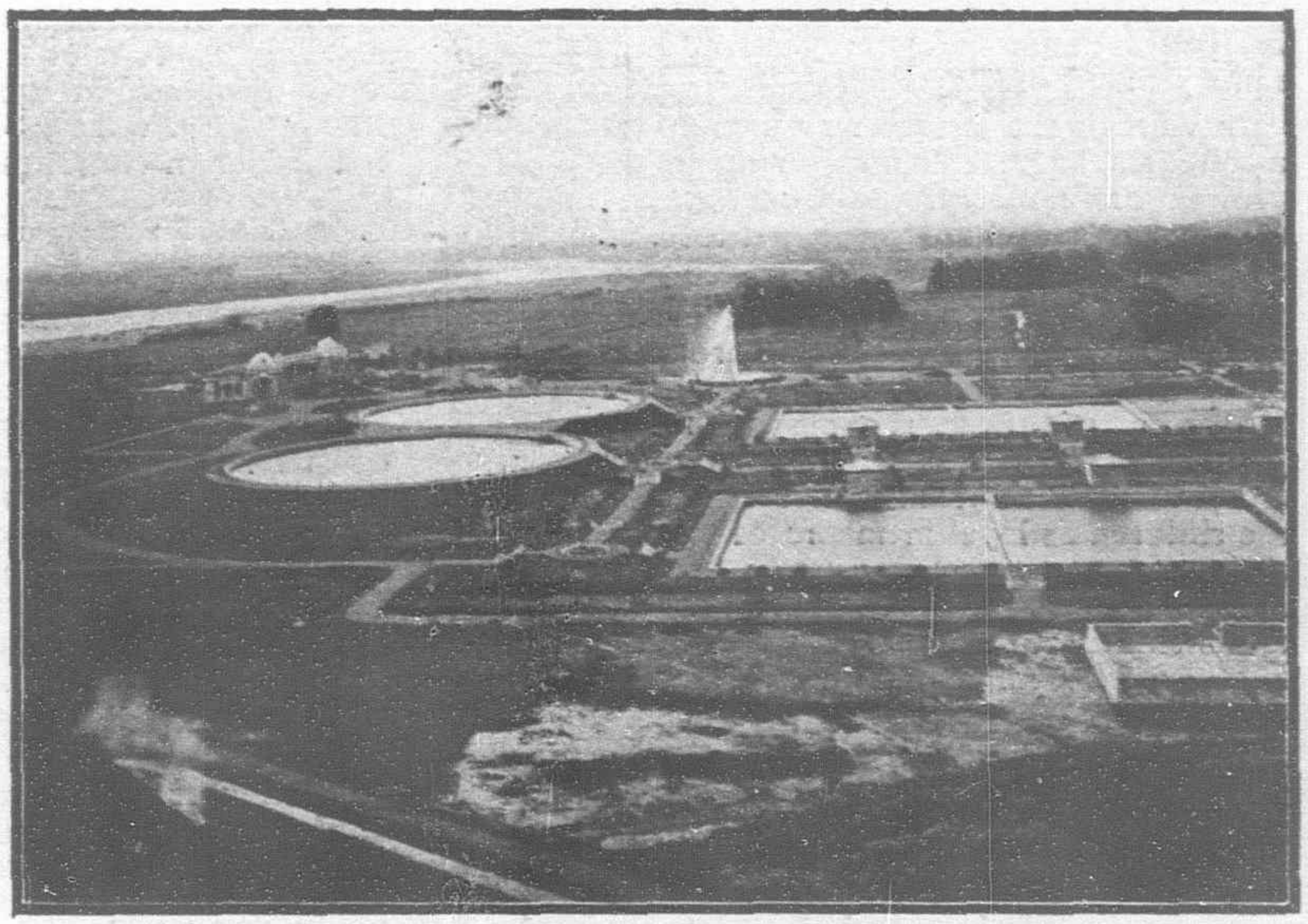
ROADWAY ALONG IRRIGATION CANAL



THE IEU LI ZEN DAM AND SLUICE



THE SZE TAZ DEN (LION'S HEAD) DAM AND ITS SLUICE



THE TAIHOKU WATER-WORKS

buildings of steel-concrete frame are fire proof and the two big saws are able to cut a timber of 6 ft. diameter; the whole machinery being run by electric power. Timber is brought to the mill on suspended cables, while inside it is moved about by an automatic apparatus. Sawdust and clapboards are used as fuel for producing electricity.

Climate of Taiwan

The island possesses 6 Meteorological Stations, 1 Observatory and 10 Light-houses, 71 Rainfall Gauge Stations and 18 Storm Warning Stations, distributed in the principal centres. Lying partly in the tropics and partly in the sub-tropics, Taiwan's summer is long, while it knows no severe winter. It is hottest in July and coldest in February. Its rainfall is the greatest in the southern part in summer, and in the northern part in winter. The temperature rises to upward of 90°, in some years as early as April and remains there as late as October. The winter is mild and seldom brings frost, while it never snows except on the highest mountains.

Education of Formosans

The first attempt at introducing modern education was made in May, 1895, when the Educational Office was opened in the newly established Government of Taiwan. But Taiwan was at the time not yet wholly pacified, and in the midst of military activities no permanent school could be established. The members of the Educational Office, however, gathered together a few native children and taught them the Japanese language. It was an experiment, but repaid the labor by giving the teachers much needed experience. In September a class of 21 native Formosans was formed and proved a success. But on New Year's day an insurrection broke out, the city of Taihoku was surrounded by insurgents, and in the affray some of the teachers were killed.

In May, 1896, the National Language School was established at Taihoku, and similar but simpler schools were opened in important towns. In July, 1898, Elementary Schools like those in Japan proper were established for the benefit of Japanese children. In April, 1899, normal schools were established for training native teachers, but were abolished later, it being regarded more convenient to have native teachers attend the National Language School. In May, 1907, a Middle School was established at Taihoku, and as its annex a High School for Girls (these replacing the boys' and girls' middle grade departments at the Japanese Language School).

Besides these attempts at education of a general nature, industrial and other special schools have been established. At Taihoku there was established in 1898 a School for Training Policemen and Prison Officers, in 1899 a Medical School, in 1900 an agricultural course at the Agricultural Experiment Station, in 1908 a Sugar Industry Course, and in the same year a Forestry Course.

In view of the increasing demand for skilled machinists and mechanics owing to the rapid growth of industry, the Government finally established a Technological Institute, completed in 1913 at an expense of 150,000 yen.

"Ko-gakko"—Public Schools are primary schools for native children and are established under the control of prefectural authorities. The aim of these schools is to teach the Japanese language and give all the ordinary moral and mental training necessary for fitting the children as loyal members of the Japanese nation. The course is usually of six years. Attendance is not compulsory, and the establishment of these schools is left to the initiative of local communities.

The Primary Schools for aborigines also are under the control of prefectural authorities. The teaching is regulated to fit the special conditions of the tribe in which it is established. The course of four years contains Morals, the Japanese Language and Arithmetic, sometimes Agriculture, Manual Training or Singing being taught in addition.

The Government General maintains one middle school at Taihoku, for the benefit of Japanese boys. The course lasts for six years with an additional course of two years to which graduates are admitted. The six years' course comprises National Morals, Japanese, Chinese, English, History, Geography, Mathematics, Natural History, Physics and Chemistry, Drawing, Singing, Practical Training and Gymnastics. In the higher two years' course are found English, Law, Economics and an additional foreign language. A distinctive feature is dormitory life, which is expected to inspire the boys with ideals of noble personality through training in etiquette and social life.

The Training Institute for Policemen is under the immediate control of the Government General of Taiwan. The school was established in July, 1898, and sends forth annually several hundred graduates.

The Medical School was established in 1899 by the Government General for native doctors and public surgeons. The Agricultural Experiment Station is under direct control of the Government General, and carries on experiments and researches for the improvement of agriculture; trains pupils in agriculture, forestry and veterinary practice; distributes seedlings, silkworm eggs, new breeds of domestic animals, and fowls; analyzes the composition of soil, fertilizers, agricultural products, etc.; and in general gives guidance and instruction by public lectures in matters of agriculture.

The Sugar Industry Experiment Station also is under the control of the Industrial Bureau of the Government General and makes experiments and researches in all matters concerning the sugar industry, at the same time giving a course which was opened first in 1905.

There are eight daily papers and thirty-one periodicals issued in Taiwan, their number constantly increasing.

Religious Institutions

The religious conditions of the Island must be said to be somewhat chaotic; the religions introduced from outside, Roman Catholic and Protestant Christianity as well as Shintoism and Japanese Buddhism, being found side by side with the religions originally existing, Confucianism, Taoism and Buddhism. Christian Missionary activities began long before Taiwan passed into Japanese possession, the Roman Catholic mission being in the hands of Spanish priests and the Protestant under the missionaries of the Presbyterian Church of Great Britain. These missions are engaged also in the work of education and charity, and in education, etc., meet with considerable success. Shintoism, Japanese Buddhism and Christianity are being propagated with much zeal but as yet with little success. The cult of the natives seems to consist in worshipping a curious mixture of deities. There is no question that the natives show much zeal in attendance at their temples. In 1915 there were 9 Shinto, 60 Buddhist and 192 Christian churches or preaching halls.

Judiciary System

When Taiwan passed into Japanese possession in May, 1895, law courts were established in accordance with the provisional regulations of the Governor-General in Council, issued under a military administration. These courts consisted of one Central Court with branches. When the military administration was abolished, civil administration was introduced by establishing Local Courts, Courts of Appeal and the Supreme Court. In 1898 the Supreme Court was abolished, making the trial at the Appeal Court final.

In all civil cases, the Japanese Civil and Commercial Codes are applied where Japanese or foreigners (Europeans) are litigants while the judgments in cases in which the natives of Taiwan or Chinese are concerned, are based on the old customs of the Island. The natives and Chinese, however, come under the operation of the Criminal Code. In actions concerning real estate the judgment is based on the old customs, even where Japanese or foreigners are concerned. In 1904, local administrative officials were given power to intervene in civil disputes occurring among the natives under their jurisdiction, and it was provided that when such a mediation prove successful, the dispute shall not be brought before a court of justice. In criminal cases, power was conferred on the police to pass summary judgment or immediate decision when the punishment involved was no heavier than three months imprisonment or a fine of 100 yen thus saving both time and expense. Further the police were empowered, when deemed advisable, to substitute a fine for an imprisonment of three months or less, and flogging for a fine of 100 yen or less. These innovations meet special conditions existing among the natives.

Distribution of Police

The first introduction in Taiwan of modern police system dates back to August, 1895, when 70 police sergeants and 700 policemen were landed at Taihoku and sent to places of importance in the interior. In April, 1896, a police force similar to that in Japan was organized and increased to 230 police sergeants and 1,387 policemen. The police force thus greatly strengthened in number was found still inadequate to preserve peace; and in order to give better protection to peaceful inhabitants what was called a three-fold policing system was adopted in 1898.

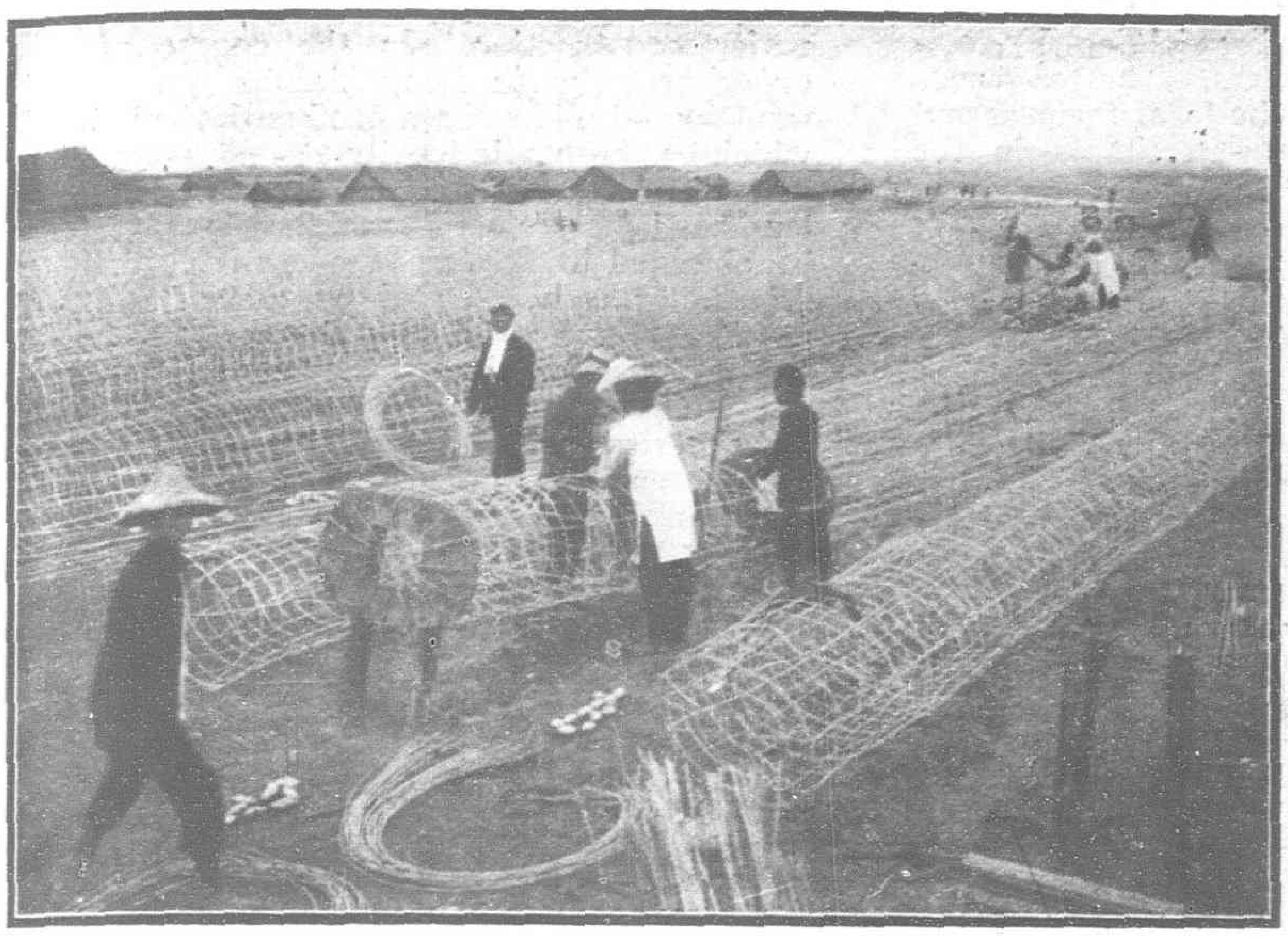
Under this system the subjugation of insurgents hiding in the mountains was entrusted to the army, the policing of settled villages to the ordinary police, and the lands between these two guard lines were placed under the joint care of the gendarmerie, and police. For some years natives have been employed as assistants to the police with markedly good results. It is largely due to this perfected system of police administration that operations against insurgent uprisings have been so successfully carried out. The police also have the work of keeping track of the households and movements of the people.

Aborigine Affairs

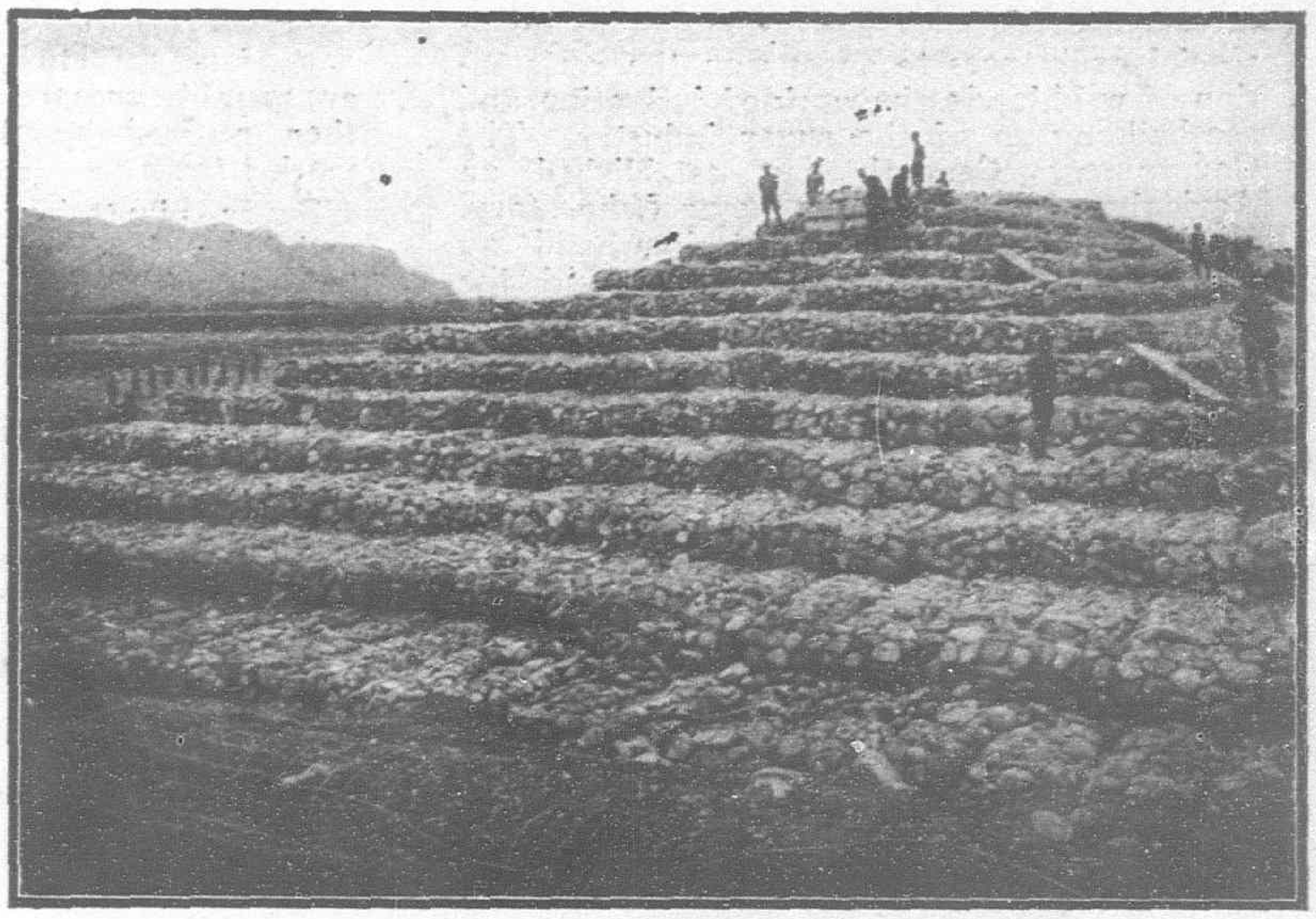
In 1896 all affairs connected with aborigines and aboriginal regions were placed in charge of the Industry Department of the Civil Administration Board; and there were established 11 stations for the domestication of the aborigines. After various changes the Aborigine Affairs Regulations were issued establishing Districts presided over by a Police Inspector.

The aborigines, divided into many tribes, occupy more than one half of the area of Taiwan, their total population being estimated at about 120,000. There are nine main groups of tribes:—the Taiyals, the Saisset, the Bunnun, the Tsouu, the Tearisen, the Paiwan Piyuma, the Ami and the Yami. Among the various tribes, the most warlike and ferocious are the Taiyals. The main strength in advancing the "aiyu" or "guard line" is directed against this tribe. The Bunnuns and the Paiwans are also daring savages; but they may be regarded as tractable in comparison with the Taiyals. Living in plains, the Amis have more chance to come in contact with civilization, and are gradually becoming accustomed to agricultural life. The Yamis, who live in solitary islands, are the most backward.

The work of domesticating the aborigines is carried on by teaching them industry, by giving them education and free medical treatment. The aborigines are not entirely unacquainted with the tilling of soil. Their usual method consists in burning forests or plains, and sowing or planting the upland with rice, millet, potatoes, beans, etc., after slightly scratching the soil (some of them sow seeds without tilling). They do not really cultivate; nor do they ever fertilize lands. After two or three years when the productive power of land gives out they turn to new places to repeat the process. The Government has opened, in several prefectures, model farms for teaching



Making Iron Wire Dike Forms



The Iron Wire Dike System in Place

simple farming methods, such as hoeing, weeding, etc.

The art of weaving is not unknown among the aboriginal women. Though rude in construction they have looms on which they weave cloth for household use or for barter. Five training institutes to teach them an improved method of weaving have been opened.

At the children's training institute in Toyen Prefecture an instructor skilled in the use of the lathe is employed to teach the aboriginal boys the making of wooden trays, bowls, etc. They have readily taken to this handicraft. At a similar institute in Kagi Prefecture rattan working is being taught the aboriginal boys and young men.

Between 1896 and 1901 attempts were made to give the rudiments of education to the aboriginal children, but with little or no result. Only after the latter year, when the education of aborigines was placed in charge of the Prefectural Governments has the work been carried on under a uniform plan with something to show. In 1905 ten public schools for the aboriginal children were established in the Prefectures of Taito and Koshun; the number being later increased to sixteen. But these efforts are confined to the more domesticated of the tribes. To disseminate education more widely among the aboriginal tribes in general and to introduce Japanese manners and customs among their children, and through them to extend civilizing influences to their parents and elders, the island authorities have since entrusted the police with the work of reaching and teaching young aborigines, wherever possible.

The aborigines have their own code of morals handed down from ancient times. They have strict rules regulating relations between the parent and child, between brothers, between husband and wife, and between the old and the young, well in keeping with the ethical principles of piety, devotion, fidelity and reverence. They are, also, ancestor worshippers, and are very loyal in observing traditional teachings. Even their custom of head-hunting has a patriotic meaning with them, in that it originates in the pious desire to defend the land bequeathed by their ancestors against the encroachment of alien people. Being thus based on such a motive, it is no easy task to persuade them to give it up. In view of this the Government's plan is to convince the tribes of the futility of resistance by the pushing forward the Aiyu lines and by sending out punitive expeditions, and then to induce them voluntarily to surrender their fire arms. Then effort is made to convert them morally and spiritually by stationing religious teachers of firm resolution and unshakable faith among them. The wives of some of these teachers have been entrusted with the work of reaching and winning over the aboriginal women.

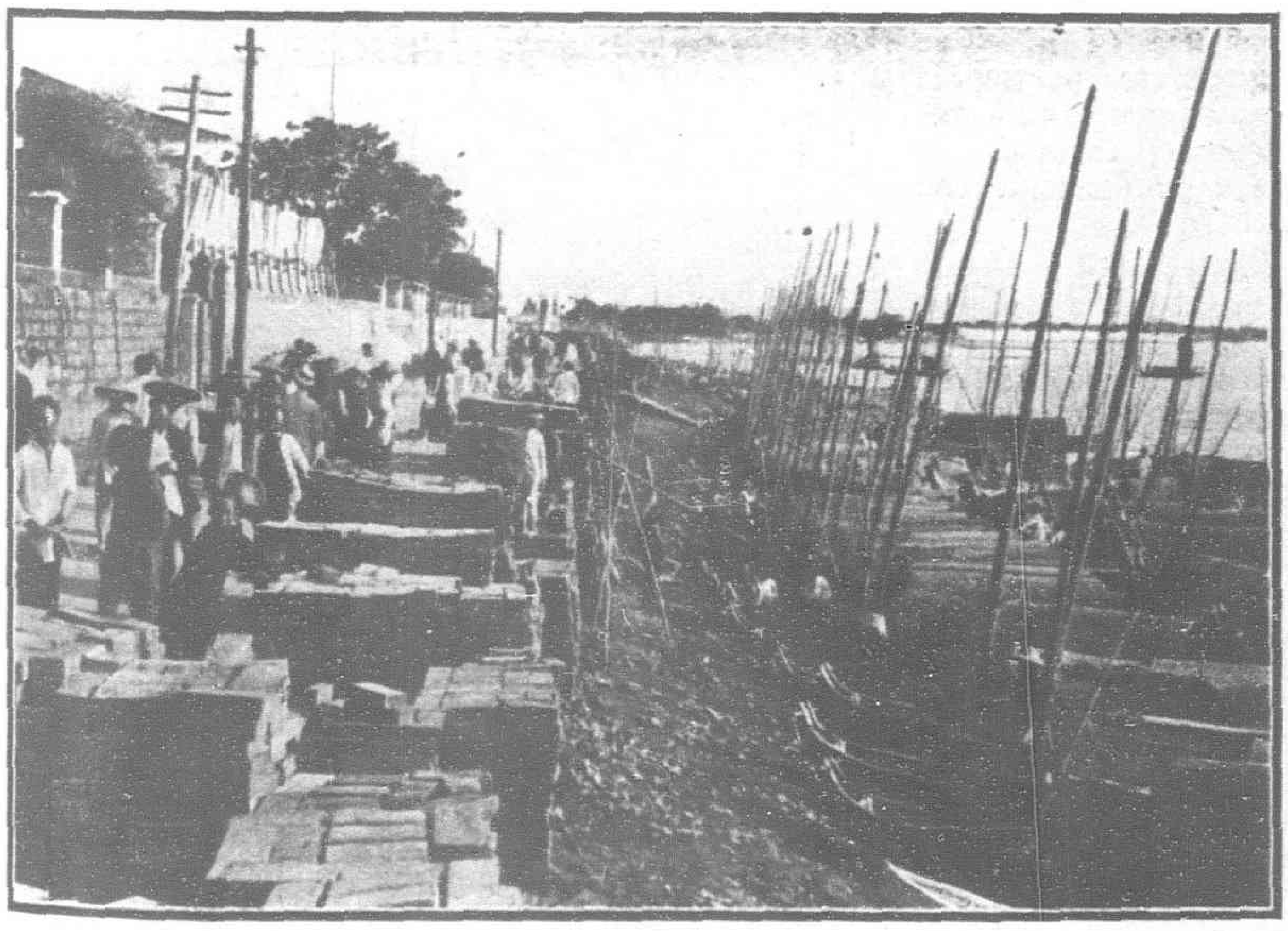
Subjugating the Tribes

Two methods are used in subjugating the defiant tribes. One is the pushing forward the Aiyu or guards lines and the other the punitive expedition. The Aiyu is a line of outposts surrounding ferocious tribes. Along the intended line a road is cut across mountains and valleys, and the inside of the line is cleared for some distance of trees and shrubs, in order to facilitate shooting. On this road, outposts consisting of 2 to 4 aiyu-men (native guardsmen) are stationed every two or three cho. At every two or three outposts is stationed the superintending agency consisting of a Japanese policeman and several aiyus, while the whole line is placed under the control of a police sergeant and his subordinates. At strategic points machine guns are placed and wire entanglements are set up, thus making it impossible for the savages to cross the boundary and attack peaceful inhabitants. The advancing or pushing forward of the line means the gradual shifting and closing of this line on the tribal headquarters, steadily circumscribing them within narrower limits.

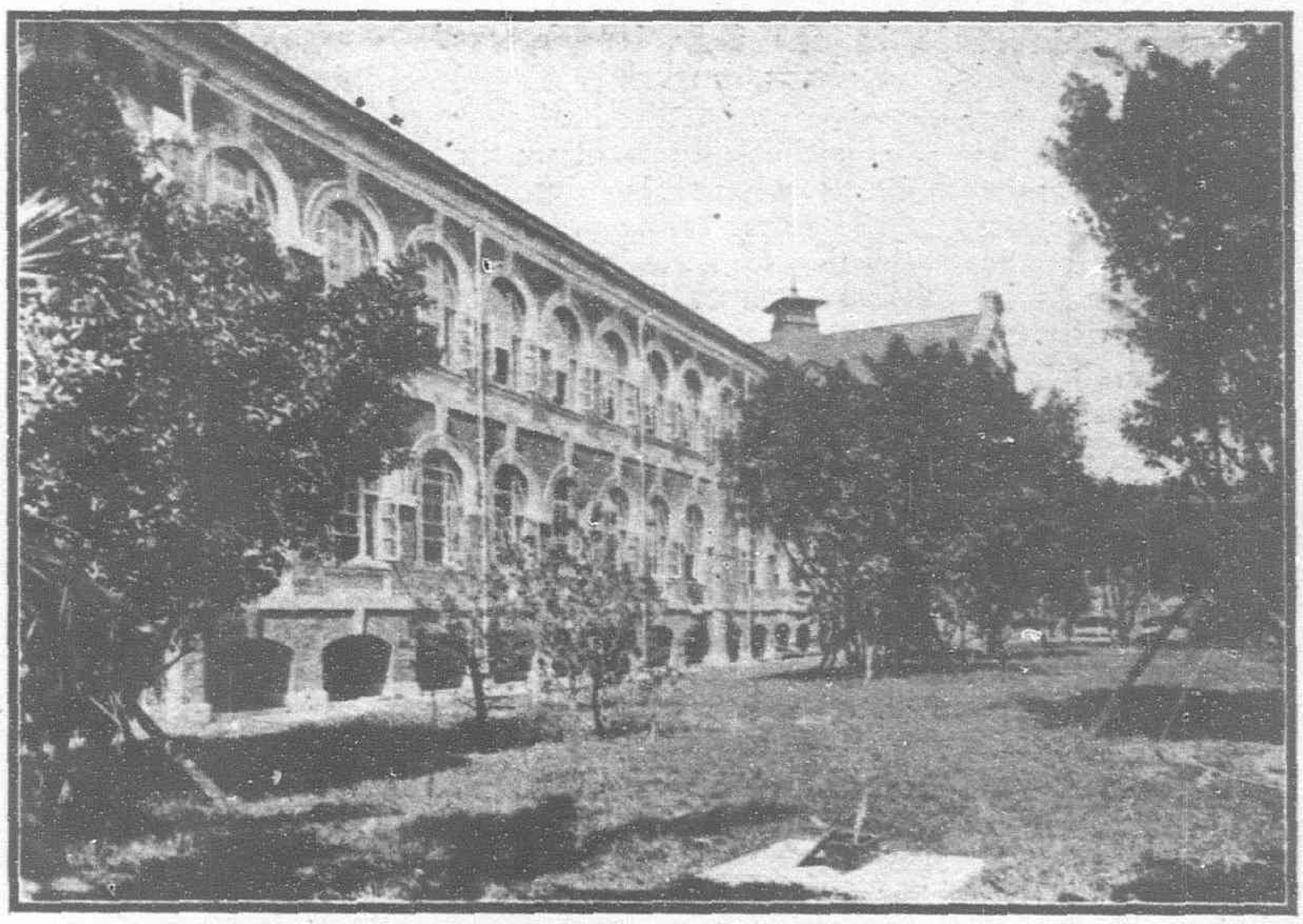
Punitive expeditions are formed and put in operation when the refractory aborigines offer organized resistance in defiance of peace time police force, the object being to punish and bring them into submission. These expeditions are conducted by bodies of policemen sometimes assisted by the regular troops. The guard lines have been advanced or new lines set up forty times, and ten or more punitive expeditions have been conducted.

Agricultural Productions and Settlers

The soil and climate of the Island are well fitted for agriculture. To add to this, the



On the Great Oak River



The Taihoku Hospital

Government General has promulgated many special ordinances to encourage the reclamation of wild lands, the work of irrigation and the building up of the sugar industry. The Government General has established an Agricultural Laboratory, a Sugar Laboratory, an Experimental Tea Plantation, and an Experimental Horticultural Station, with the object of disseminating an agricultural education by carrying out experiments, and also by enlisting students. More recently the Government General issued regulations for the encouragement of sericulture, which has a great future in the Island. Since these measures of agricultural administration have been in operation there has been conspicuous activity in all agricultural industries and considerable increase in production.

The total area of land for which permit to open up was issued up to the end of December, 1914 in accordance with the above regulations was 54.773 ko, of which 4.276 ko have been conferred the industrial rights. The area provided with newly cut irrigation canals stood at the end of 1914 at 158,679 ko officially recognized and 72,874 ko not officially recognized; total 231,679 ko.

The agricultural work of the Island is carried out on lands long since under cultivation as well as those newly opened up. The utilization and economy of land coming under the former category have been intensified and they have shown marked advance in their productive capacity, so that their total outputs were valued at over 100,000,000 yen at the end of 1914.

Occupied lands are about 10 per cent of the total land area of the Island and something over 54 per cent of the "administration zone." Of those cultivating these areas, 358.072 are independent farmers, 242,206 part independent and part tenant farmers, and 272,390 tenant farmers, or a total of about 1.000.000, that is, about 30 per cent of the entire population of the island. Add to this number 1.014,287, persons employed as farm hands, and it is seen that about two-thirds of the whole population belong to the farming class.

Principal Agricultural Productions

The production of rice has greatly increased of late, the area of land cultivated for the purpose reaching 492,944 ko in 1914, yielding 4,489,000 koku of rice, valued at 51,676,000 yen. Rice, thus, comes second only to sugar in the list of the Island's agricultural products and forms 40 per cent of their entire value. The Island's transactions in rice with Japan were opened in 1897. In 1898 the price of rice rose high in Japan and the exportation of the cereal from the Island made a sudden increase. Since then its shipment home has gone on steadily so that to-day the entire surplus after supplying the needs of the Island is forwarded to Japan, and in 1914 its export amounted to 680,000 koku valued at 7,900,000 yen. The rice of two crops in one year (1913) was 2,346,998 bushels. (Koku=5 bushels).

The peanut or ground nut, is raised all over the Island, especially in the sandy soil on the river-side and sea-shores, where it is cultivated as an after crop to the sugar cane or sweet potato. Besides yielding an oil, its leaves and stalks go to feed horses and cattle. Its area is 19,414 ko.

Though found more or less in every part of the Island, sesame is most largely cultivated in Kagi, where it is chiefly used for the expression of oil. It is grown on 10,953 ko.

The island in 1913 exported 17,000,000 kin (Kin = 1⅓ pounds) of tea, worth Y 6,434,680, and the plant forms one of the main-stays of its trade. The shrub grows luxuriantly in the northern provinces of the Island, the Toyen district being most noted while Daitotei is the chief market.

The tea zone of the Island is hilly and undulating with high plains. Both soil and climate are well suited for the growth of the shrub. There is not a hill side or an elevation that has not been turned into a tea plantation. The area of tea plantations in 1914 aggregated 33.383 ko yielding Y7,000,000 of manufactured leaves. The tea leaves are roughly prepared by the local farmers and then re-fired by the tea-merchants in the market town.

Sugar plantations were formerly found mainly south of Dakusuikei, where the lack of irrigation facilities made it impossible to raise rice. The native sugar industry of Formosa possesses a history dating back hundreds of years, but has always been primitive, the variety of canes being of inferior kind while the method of cultivation has been carelessness itself with no attention paid to the problems of fertilization and irrigation, and consequently the crop amounted to only 40,000 kin per ko (*21,200 lbs. an acre*) with five to eight per cent of sugar.

When the Government General undertook to introduce improvements in the industry in 1903, it, therefore, began the work by endeavoring to persuade the planters to reform, at the same time extending aids in furnishing fertilizers and young plants, while insisting on advanced methods of cultivation. As the result of improvements in the method of cultivation the crop per ko has increased to 50,000 kin or more with 10 per cent or more of sugar. Besides the plantation area has also greatly increased, and in 1914 the sugar crop was seven times that of 1903.

Other crops are indigo, "tree indigo," ramie, jute, pine apple fibres, China grass, tobacco and fruits, among them oranges, lichees, persimmons, plums, peaches, bananas, and pine-apples.

The number of settlers received up to the end of 1913 was 73 937 persons, of whom 18,671 were men and 55,766 women. Their health condition is good.

MYSORE SANTALWOOD DISTILLERY

The establishment of a factory in Mysore state, India, for the manufacture of sandalwood oil marks another step forward in the gradual elimination of raw materials from exportation and their replacement by the finished or at least partly manufactured products. Not that sandalwood (properly santalwood) oil has not been a manufacture of India, but the product turned out by the small and badly equipped native plants has been so crude and has suffered so many adulterations in its progress to the final markets that these were finally shut to it and the native buyer was left alone in his handling and use of it. The distillation of the wood by private persons is prohibited in Mysore state, anyway, and the few tons of the wood that passed through the rude native stills, was the product of the border areas of the forests.

Manufacture of essential oils is a highly technical process which has been a gradual development in Germany and France, which countries were the ultimate buyers of the santalwood, and as knowledge of these methods had not penetrated to Mysore, as a preliminary to any proposals to set up sandalwood distillation in Mysore, it was decided to have the whole question thoroughly investigated and this work was entrusted to Professor Sudborough and Dr. Watson of the Indian Institute of Science. During the whole of last year and up to the present time the matter has been under experimental investigation and the results obtained are of a sufficiently satisfactory character to warrant the establishment of an experimental factory where the oil will be manufactured on a commercial scale.

This new factory which will cost about one lakh (R. 100,000=$32,400 gold) of rupees is under construction. In the course of the experimental work, a considerable quantity of sandalwood oil has been produced, the bulk of which has been sold locally at very favourable prices and the oil which has been sent to England has been declared equal to the best that can be obtained in Europe and has fetched equal prices. It is hoped that by the end of this month (March) the new factory will be at work, producing about 2,000 pounds of sandalwood oil per month. The oil produced with the experimental plant is now selling freely at Rs. 18 per pound whilst the price on the London market is as high as 30 shillings a pound. To pass the test to which the oil is subjected in Europe, complete chemical control is necessary and every consignment of oil sent out from the factory will be subjected to an examination, and a certificate as to its quality issued. In this way it is hoped to be able to overcome the prejudice against the sandalwood oil manufactured in India and to retain in the Mysore State the profits on the manufacture of the oil which have hitherto largely gone to Germany.

Although sandalwood oil has been manufactured in India from time immemorial, this venture is practically a new industry as the methods intended to be pursued are from the beginning entirely different from current Indian practices. The annual auction sales of sandalwood will still continue and the new factory will purchase sandalwood from the Forest Department at the same prices as paid by outsiders. If the industry proves profitable, it is under contemplation to establish a distillation plant of sufficient size to deal with the whole annual output of the sandalwood of the south of India. The advantages possessed by a local distillery worked on modern lines are very considerable, and it is expected that not only will the State be able to maintain the revenue hitherto enjoyed from the sandalwood monopoly but largely to increase it. The disposal of sandalwood in Mysore, we are reminded, is a State monopoly which in recent years has produced a large net revenue. In 1913-14 just previous to the outbreak of war this revenue amounted to 19.87 lakhs of rupees produced by the sale of 1.862 tons of wood. The wood is mainly disposed of by auction sales held in the months of November and December, but after the outbreak of war there was an almost complete cessation of the demand from European buyers. Latterly the business has revived and at the auction sales at the end of last year good prices were obtained for a fairly large quantity of wood.

UNLOADING OIL TANK CARS

At oil tank stations where two or more different kinds of oils are stored, pumping plants are being used for transferring oil from the tank cars to the storage tanks.

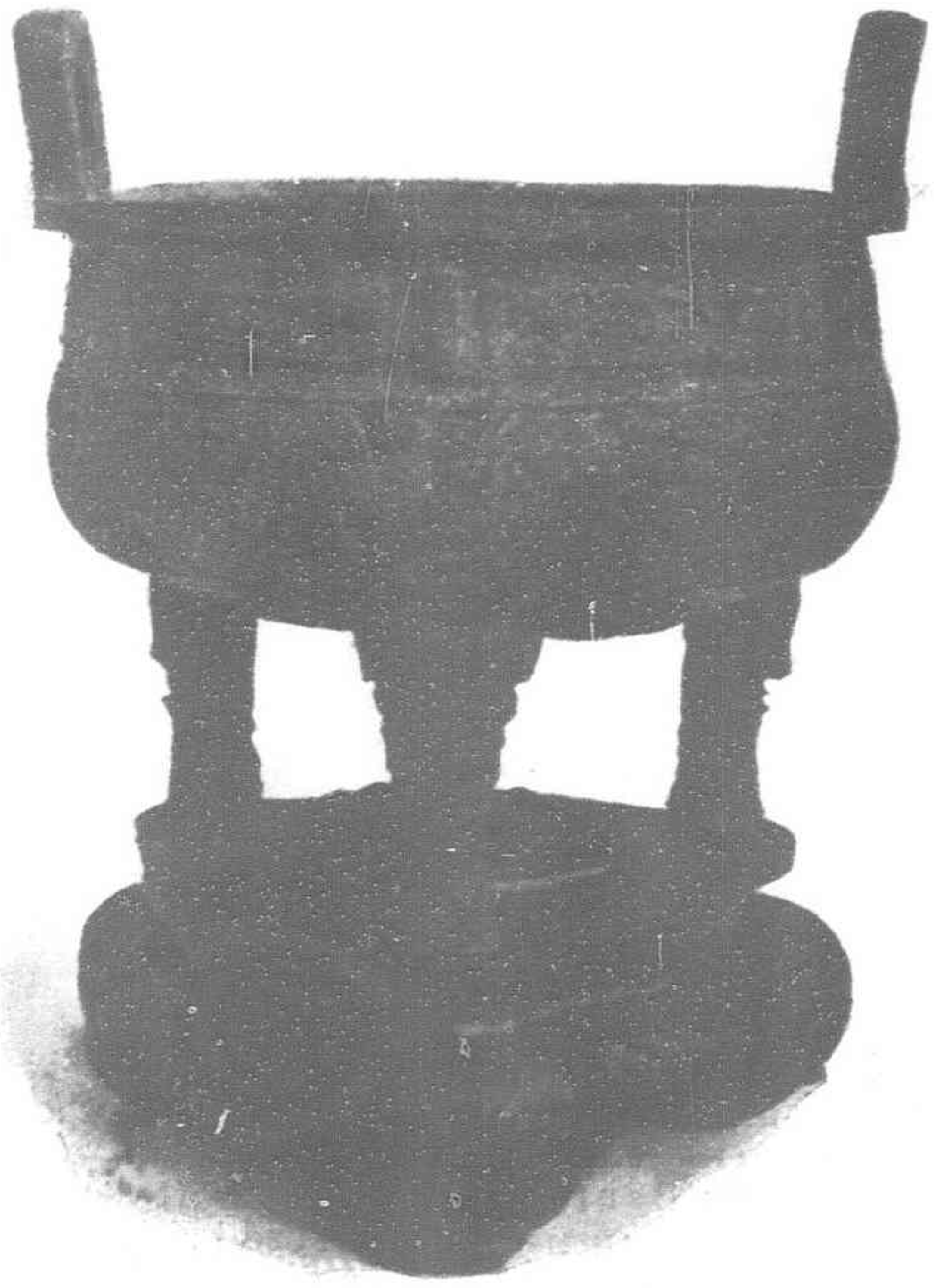
The outfit which is made by The Goulds Manufacturing Company, Seneca Falls, N. Y., and is known as their Fig. 1668, consists of 2 Goulds 6"x6" "Pyramid" Single Cylinder, Single Acting Piston Pumps mounted on one base with pulley between. The shafts of both pumps are fitted with jaw clutches so that the pumps may be operated separately or both at the same time.

As it is not convenient to always clean the pumps this is an ideal outfit for such service as the same pump can always be used for handling the same oil.

AN EXAMINATION OF CHINESE BRONZES

By John C. Ferguson, in the Annual Report of the Smithsonian Institution.

It is important that, in all branches of Chinese art, the rest of the world should understand the Chinese point of view. Without a careful survey of the historical development of the country it is impossible to enter into the intricacies of their art interpretation, but general principles can be learned by persons unfamiliar with the language of China if these are translated into our own language. There is a greater lack of accurate information concerning bronzes than in any other field of Chinese art, and this is not for the reason that Chinese literature is not rich in books on this subject. The purpose of this article is to bring to the attention of the western world a succinct authoritative statement of the principles recognized by Chinese connoisseurs in the examination of Chinese bronzes. The original text is written in short nervous sentences which I have frequently joined together to make the meaning clearer.

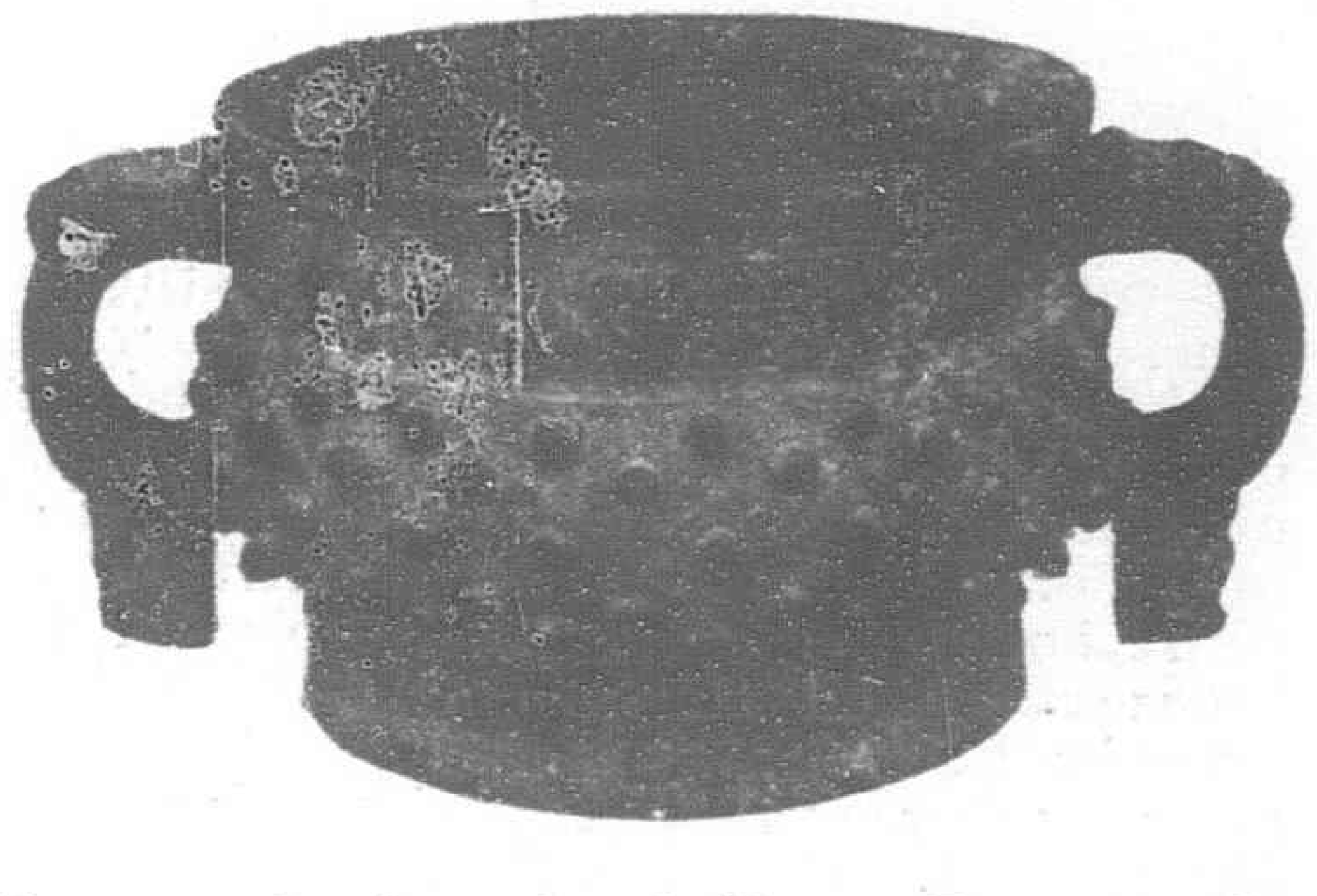

Tripod bronze vessel of Chow Dynasty, known as the K'o Ting; supported on wooden stand.

The following account was written in 1767 by Liang T'ung-shu, the son of Liang Shih-cheng, a noted official of the reign of Chien Lung, who was an eminent authority in archeological research, especially in connection with the places around West Lake, Hangchow. The son was employed in the palace as an expert.

Covered tripod bronze vessel, of Shang Dynasty, decorated with pinniped pattern—k'uei wên; four suspending rings on cover; color of bronze is mercurial and is iridescent.

This account was in manuscript and was published only in 1913 by the Shen Cho Kuo She, Shanghai, in its encyclopaedia of fine arts, Mei Shu Ts'ing She. So little has been written on this subject that the following translation may be of some value to the increasing number of students of this interesting branch. The translation of the text is as follows:

What are now called antiques are the gold and silver inlaid bronzes of the Shang dynasty* and the "ting," "tsun" and "i" of King Wen, which were also of ancient workmanship, and therefore correctly classified as belonging to the Shang and Chow periods. The men of the Han dynasty were fond of the craftsman's art, as is shown by the jade pieces of that period which are of rare workmanship. It was near to the period of antiquity, and the models of three dynasties could be readily utilized. The articles produced were named after the period of their pattern, and are not necessarily to be considered as genuine products of the Shang and Chow dynasties. There are also articles which have been fraudulently said to have come from ancient tombs, such as the instance of the Hunan amulets. Such facts are well known to connoisseurs. Articles used in the Han period, like the Po-shan censers, having no distinct coloring of blue or green are not classed as ancient, but as belonging to the Han dynasty, but it must be remembered that the output of mortuary articles during the three dynasties was very great and that they were not much used during the Han. Therefore few articles were then buried, and even in the case of those which were buried the blue and green color must be very much like that of the article of the three dynasties, for the difference in age is not great. Even jades which are now found with bloodlike marks come from the Han period, and how could it be possible that bronzes could be buried without undergoing a change of color?


Bronze wine vessel, of Shang Dynasty, decorated above and below with recurved pattern—hui wên. In center are nipples surrounded by diapers. Handles richly carved and surmounted by ogre's head.

Color of Ancient Bronzes.

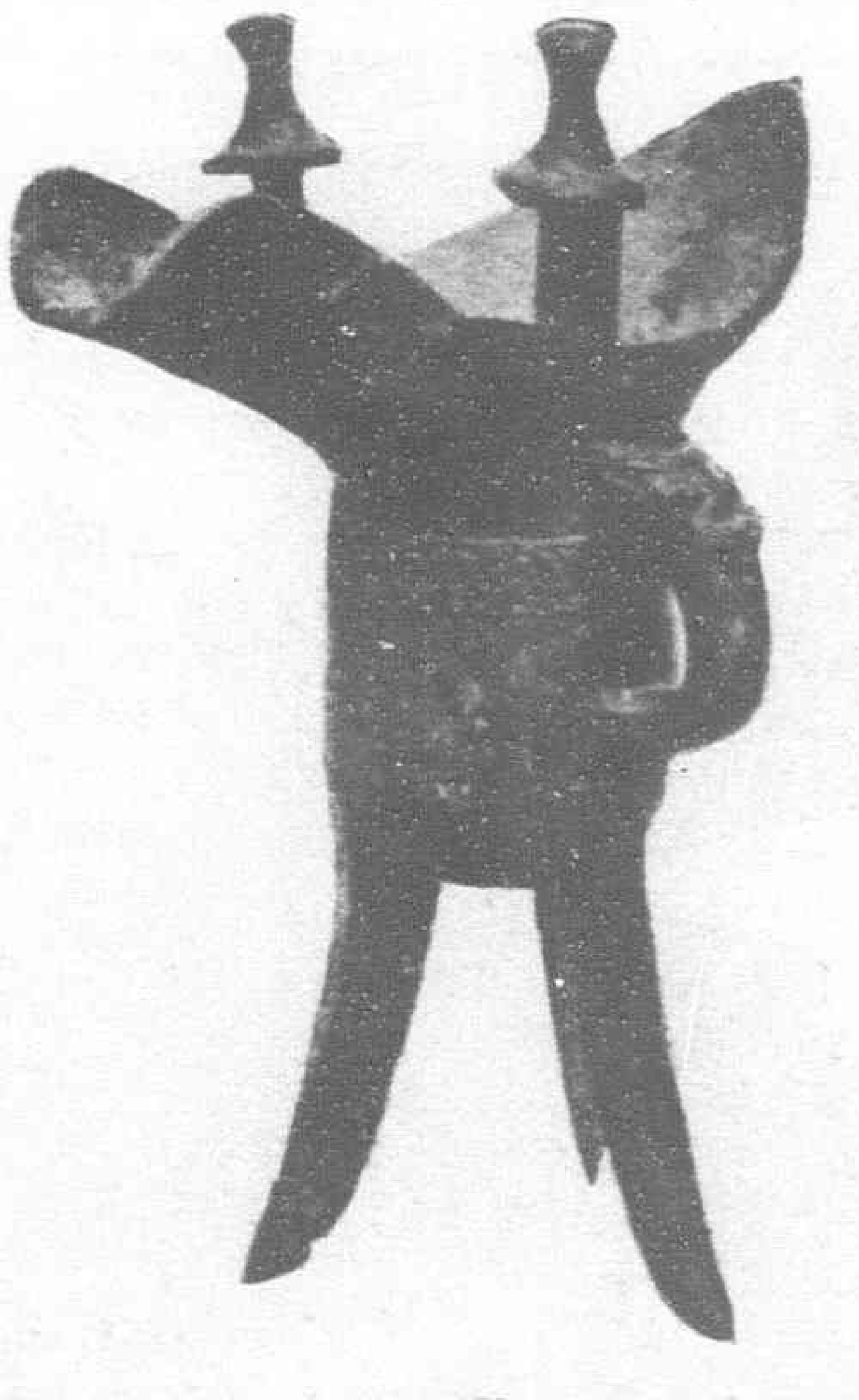
Ancient vessels which have been much exposed to the air become blue, while those much exposed to water become green. When exposed to both air and water, the colors blue and green are both produced. The tombs of the ancient kings and emperors were solidly built, so that water could not penetrate them. Those vessels that were placed on stone pedestals were in the air as long as the pedestal remained intact. Thus, being long subject to the influence of the surrounding air, the color became very pure, and, furthermore, there being no contact with the earth, the color is a pure (kingfisher) blue. This is the best variety. Inferior to this are vessels found in the burial mounds of the ministers of state where they were subject to the influence of soil and water, and thus they were colored both blue and green. The pure green ones were produced where they lay in water without being covered with the soil.

Bronze wine vessel, of Chow Dynasty, decorated with the thunder scroll—lui wên, and known as the Fu Ting I; has a cast inscription.

Burial in Earth vs. Exposure to Air.

Bronze vessels buried in the earth for a thousand years become pure blue, like that of the kingfisher. The color before noon is pale, but after noon takes on the appearance of clouds, and the kingfisher blue seems as if it would liquefy into drops. There are also places where the earth has eaten into the metal, either making a hole or forming scales and giving the appearance of snail tracks. An appearance of being the mark of a stroke of a hammer is unreal.

Bronze vessels subject to the influence of water for a thousand years become pure


Bronze libation cup, of Chow Dynasty, with one handle and two suspending hooks, known as Fu I Tsioh, with an inscription under the handle.

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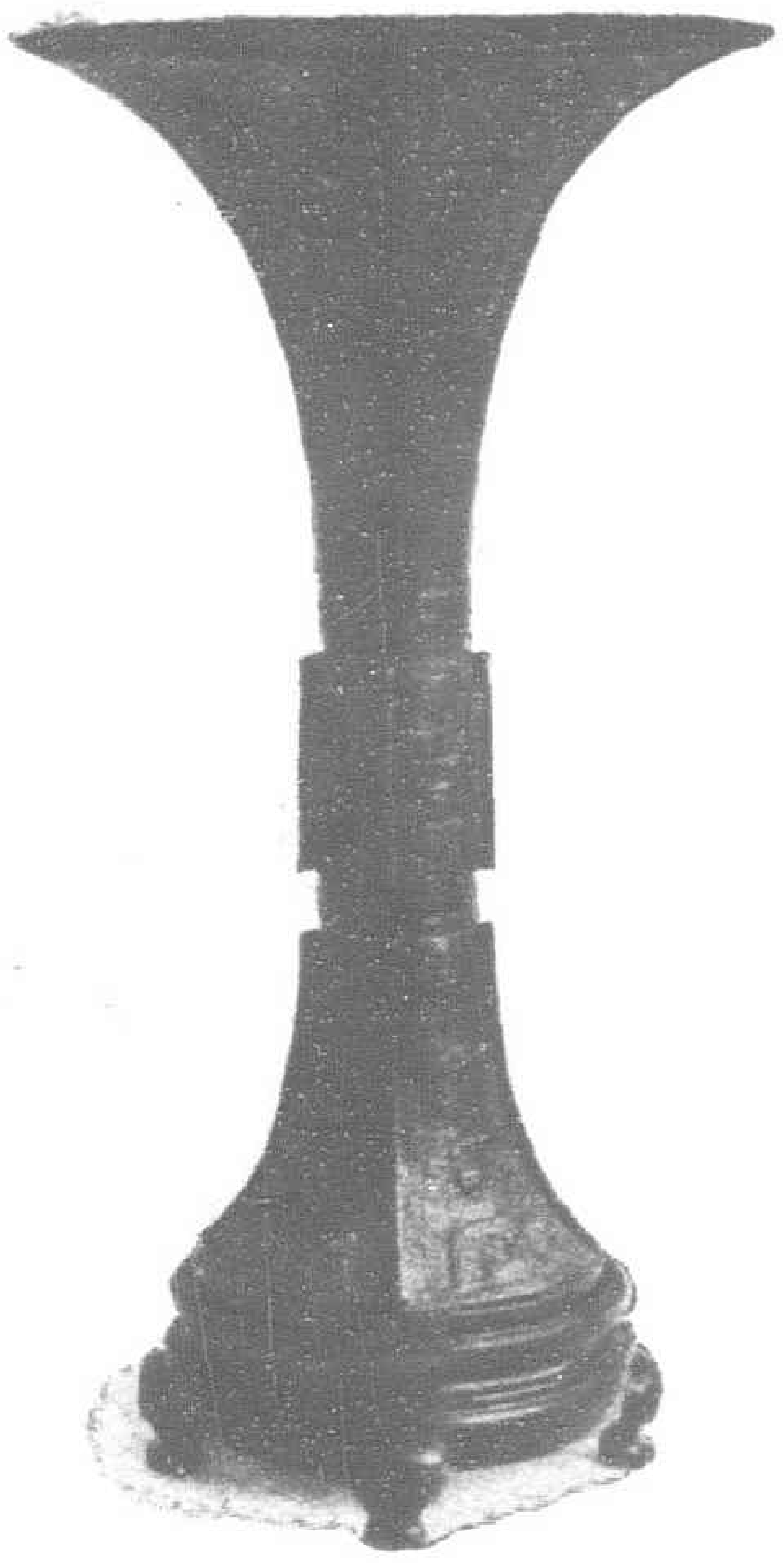
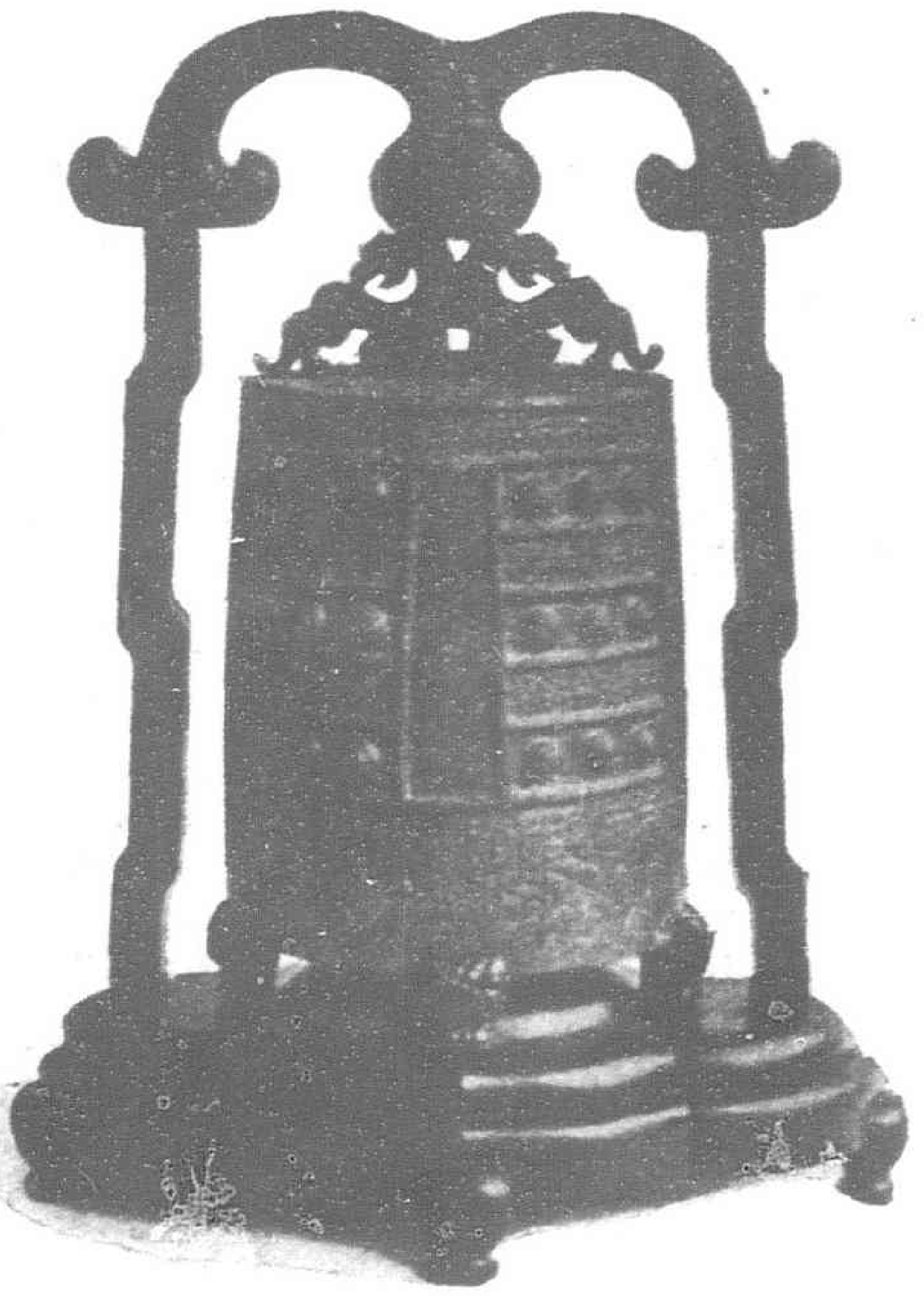
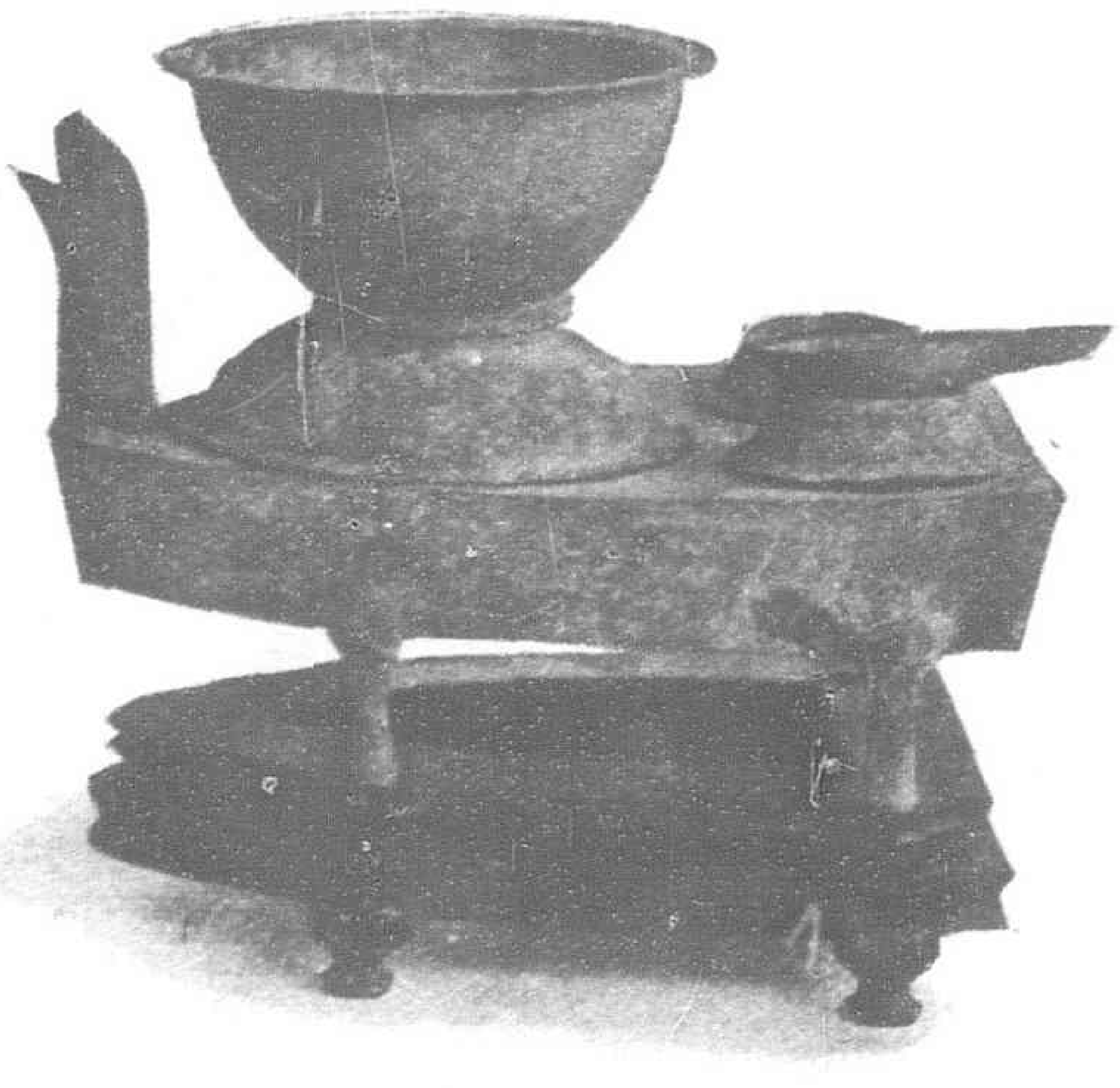
*Early Chinese dynasties; Hsia, B.C. 2205-1766, Shang, 1766-1122; Chow, 1122-255 (the preceding three dynasties known as the San Tai) Ts'in, 255-206; Han, B.C. 206 to A.D. 221.



Bronze vase, of Chow Dynasty, known as a Ku; is supported on wooden stand.

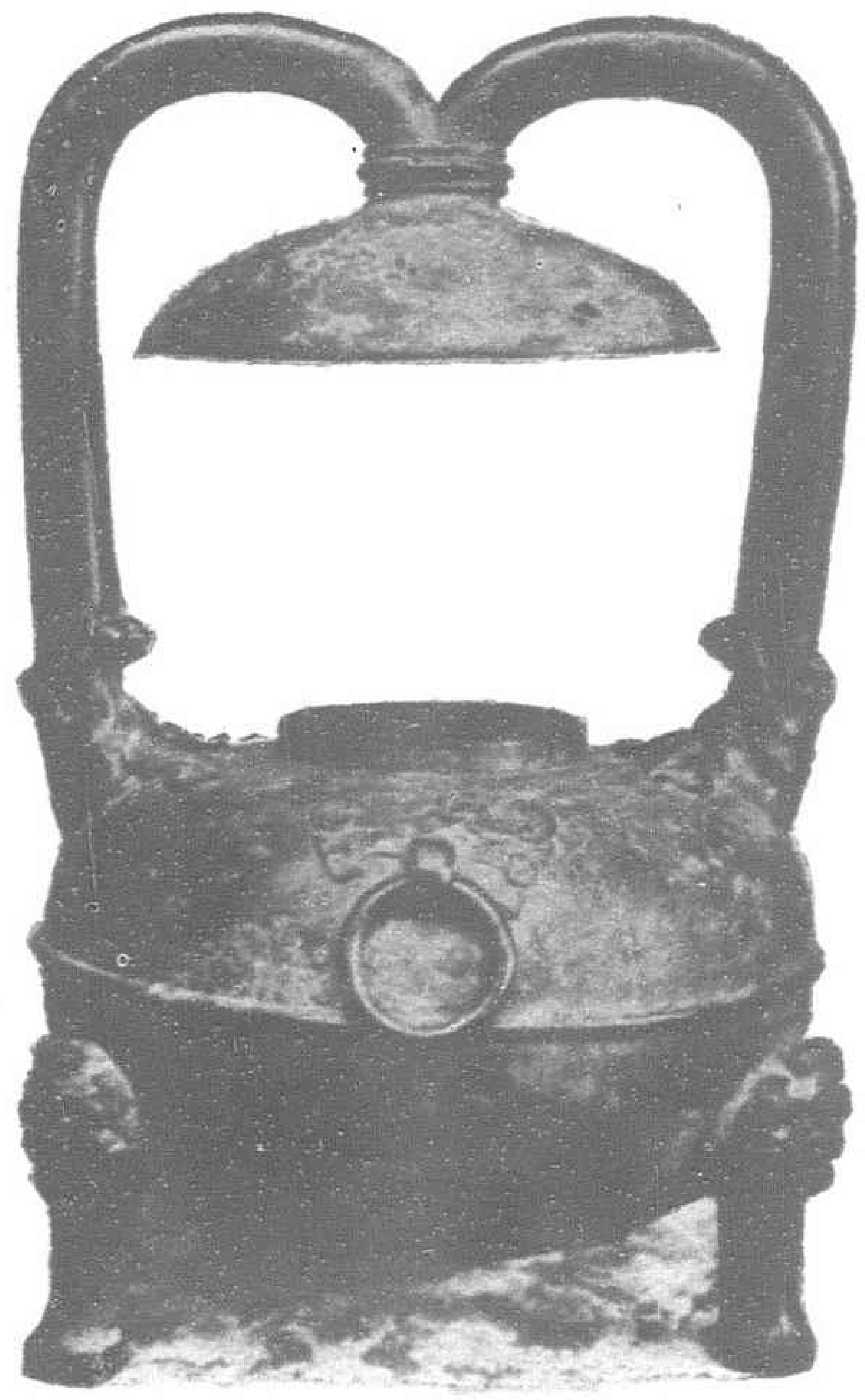


Bronze bell, known as Chung, of Chow Dynasty; supported on wooden stand with over-reaching frame; double dragon decoration at top. (Ferguson collection.)



Bronze range with utensils, of Han Dynasty; supported on wooden frame. (Ferguson collection.)

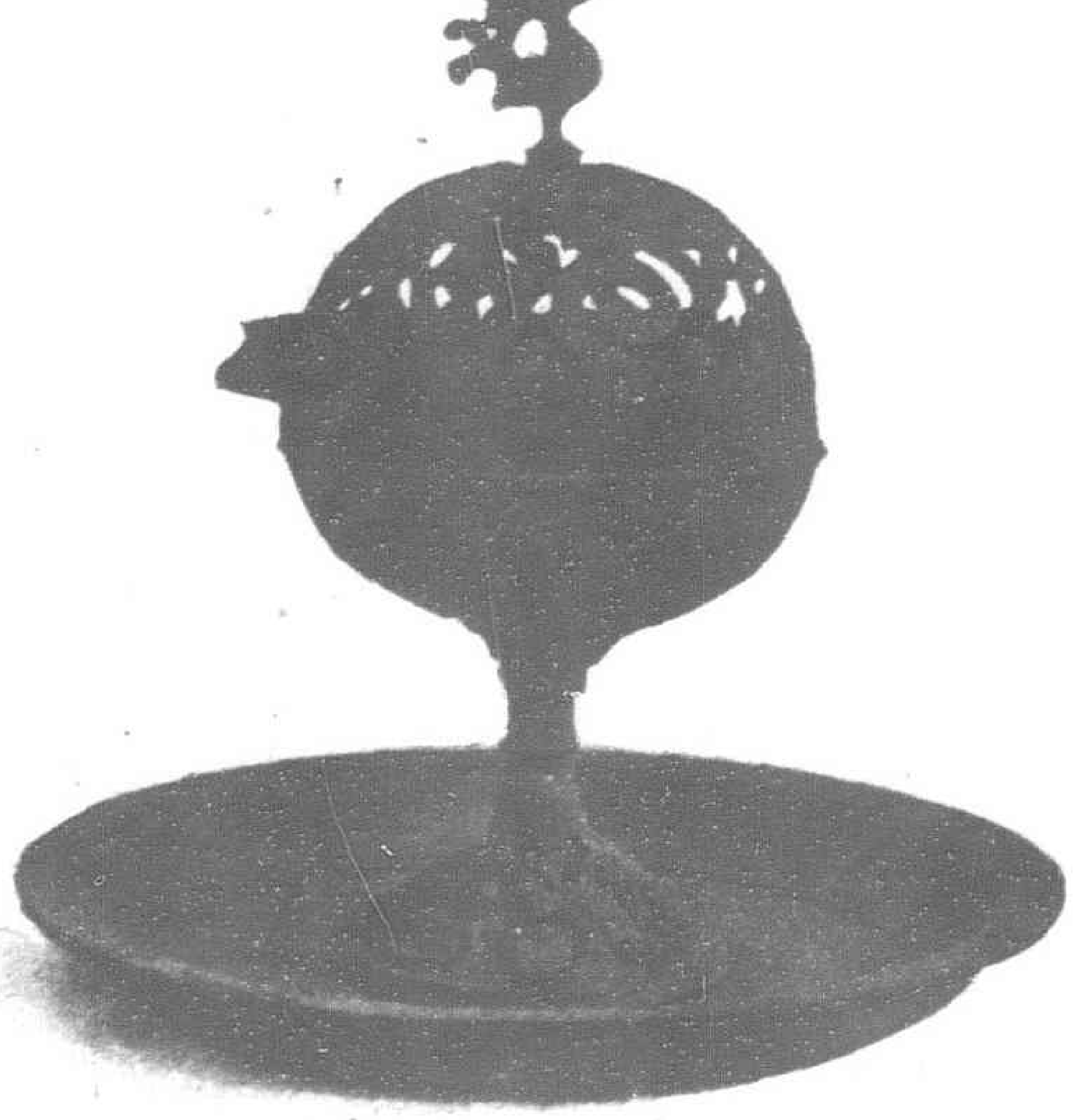
green, as the rind of a melon (kua-p'i), and glossy like jade. If subjected to such influences for a shorter time, although they may be bluish green, yet they are not bright. Corroded places are similar to those mentioned in the preceding paragraph.



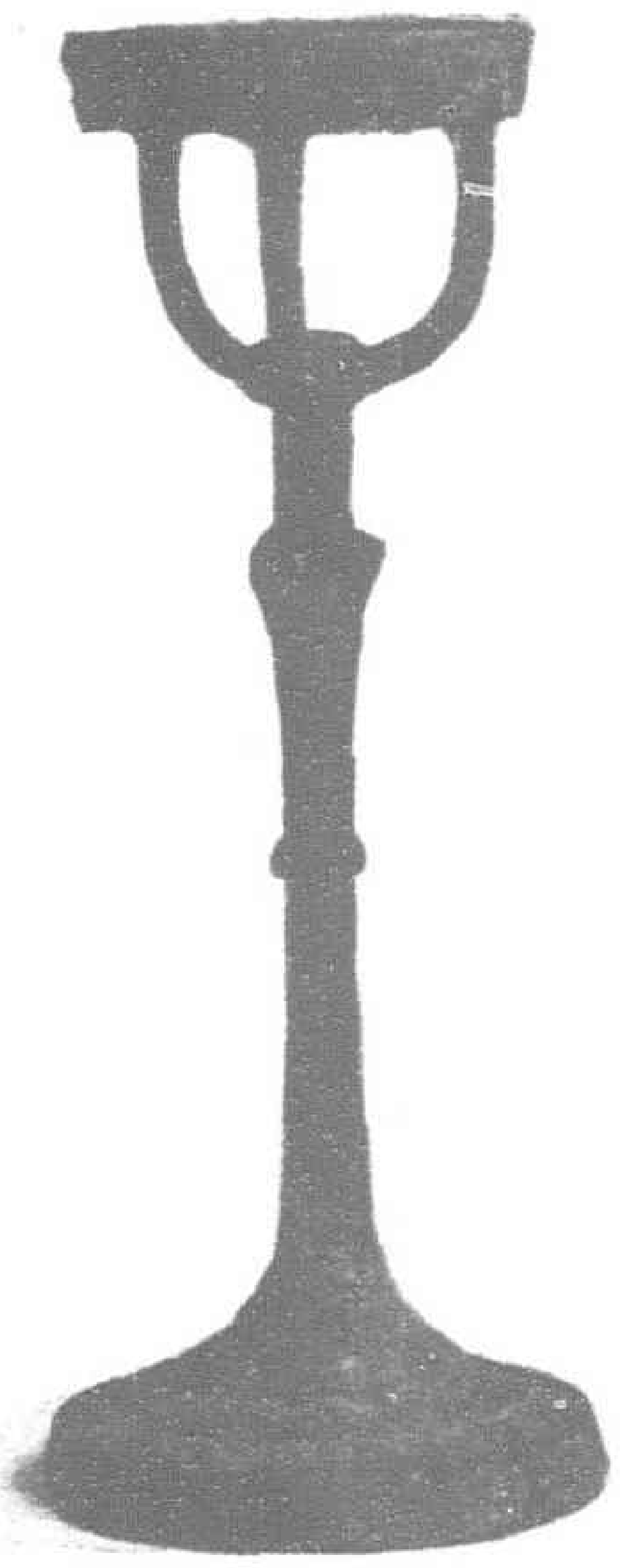
Bronze tripod wine steamer, known as a Ting, of Han Dynasty; top of legs decorated with an animal head, cover missing, hollow tubes above vessel provide exit for evaporation of wine which dripped from overhanging cover. (Collection of Mr. Pao Hsi, Peking.)

It is the present custom to call "ancient" light-weighted specimens of either of the above classes. This is done in ignorance of the fact that large vessels are necessarily thick, and that only a third of such vessels are corroded even during a long period of time. The weight of these vessels in which the bronze has only been partially corroded is only reduced by a third or a half. In the case of light, thin vessels, where the influences of earth or water have easily penetrated the entire body of the bronze, the color of the bronze cannot be seen when fractures have been made by the strokes of hoes. It is all blue or green, or there is an occasional streak of red, like red lead. However, the resonance of the metal is not lost.

Such specimens as have not been covered with earth or water and have been preserved to the present time have a dark brown color with red scales. These scales stand out like good Chen-chow sand. If immersed in hot water for a good length of time, the patina of these scales becomes more brilliant. Such specimens are of the highest value. Spurious specimens can be detected, as their color is only superficial.

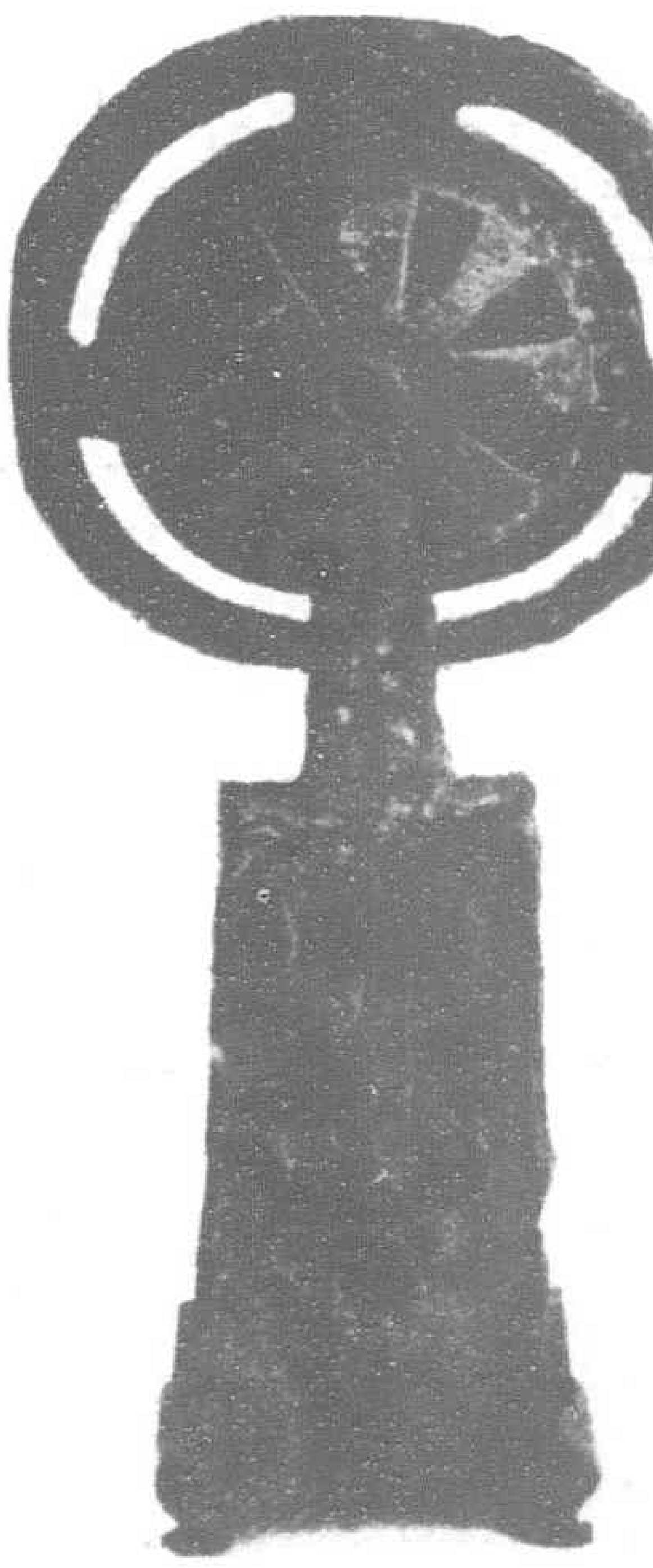


Bronze incense burner, known as Po Shan Lu, of Han Dynasty.



Bronze candlestick, known as Têng, of the Han Dynasty. (Ferguson collection.)

None of three classes mentioned above has any rank odor, with the exception of those recently exhumed from old soil, which retain a strong smell of earth for a short period. Spurious specimens, when rubbed briskly with the palm of the hand, have a distinct disagreeable smell.



Bronze musical rattle, known as Wu Lao, of Chow Dynasty, used for ceremonial dancing; has a loose tongue which rattles when instrument is shaken. (Ferguson collection.)

Color and Pattern.

Specimens of a dark reddish or black lacquer color that have been in the soil or in water for a short time may become superficially beautiful, but the beauty is not deep and they are never glossy. Such specimens are of secondary value. I have noticed that Han dynasty seals and coins which are fifteen hundred or sixteen hundred years old are rarely glossy even when they are quite green; neither do they have red scales raised upon them. Ancient specimens of bronze in which the patina has penetrated deeply are glossy like jade and have red scales, thus showing that they belong to the three dynasties (Hsia, Shang, Chow). To determine their age, attention must be paid to the gloss of specimens and then to their pattern.

Determination of Inscriptions.

Inscriptions are of two different kinds, k'uan and chi. What is called chuan (seal characters or ornamental writing) is for the commemoration of merit. This writing is on bells and tripods. K'uan is in intaglio, and such writing during the three dynasties was considered stylish. The characters were sunk into the metal. From the time of the Han dynasty, the "chi" in relief was used, with occasional use, also, of sunken characters incised by the use of tools in the same manner as if on stone tablets. Sunken chi were difficult to cast, but relief chi were easy, and thus it can be easily detected that they did not long belong to the period of the three dynasties. The "k'uan" of ancient vessels were on the inside and sunken. The chi were on the outside and were in relief. Vessels of the Hsia and Chow dynasties had either chi or k'uan, while those of the Shang dynasty usually had chi, but no k'uan. The ancients showed great care in the work. Artisans were classed by them as among the four estates of the people, and were not looked down upon as in later degenerate days.

In casting vessels the ancients used wax for their models or patterns, and the lines were thin like hairs, even, regular, and distinct. The characters of chi were rounding like the surface of inverted tiles. They were not deep or bold, and both large and small characters had the same depth. They were clear and distinct without any blurs. Such castings of carefully chosen bronze were excellent. They had three characteristics: First, they had no marks of sand granules; second, the workmanship was wonderful, and third, there was no sparing of labor. They were not made overnight. If ancient vessels are now found with the k'uan and chi blurred and distorted and cast in an irregular mold, these are the work of amateurs or imitators. The quality of the metal, its color and odor, are not the same as of good vessels.

The ancients used sacrificial vessels, such as bells and tripods, for the praise of meritorious and worthy deeds, and hence made inscriptions on them. Inscriptions were put on platters and bowls when they were used in preparation for sacrifices, but when used for domestic purposes inscriptions were often lacking, and such fact can not be used as proof of their being counterfeits. In such case the style of inscription, the quality, color, and odor of the metal must decide.

Vessels of the Three Dynasties.

The Hsia dynasty was noted for reliability, the Shang for quality, and the Chow for display; and the bronze vessels of these dynasties have the same respective differences. Vessels of the Shang dynasty are plain and without adornment, those of the Chow dynasty are finely engraved, while those of the Hsia are different from either of these. I have often seen vessels of the Hsia dynasty on which gold was inlaid thin as hairs. In course of time the gold fell out, leaving sunken places, so that the ornamentation became depressions. Such inlaying is now often wrongly attributed to the Shang dynasty by those whose knowledge is limited. They should remember the poetical quotation:

> "Engraved and chiseled are the ornaments.
> "Of metal and of jade is their substance."
> Shi King III, 1,4,5.

and thus know that these were of the three dynasties period.

New bronze vessels are those cast during the T'ang, Sung, and Yuan dynasties. From the time of the Emperor Yuan Pao (742-756 A.D.) of the T'ang dynasty, down through the Sung dynasties such vessels were made at Kuyung. Many were also made at T'ai-chow, but these were chiefly of the small lui-wen pattern. During the Yuan dynasty, Chiang Lang-tzu, of Hangchow, and Lu Wang-chi, of Ping Chiang, were noted artisans, but the figures on their work were without delicacy. However, Chiang was a better workman than Lu.

The method of determining ancient bronze vessels adopted by the Household Department of the Ching Dynasty was that vessels of the Shang dynasty were unadorned, those of the Chow dynasty were richly engraved with fine lines, while those of the Hsia dynasty were inlaid with gold which had the appearance of fine hairs. These fundamental facts can not be overlooked.

The inscriptions in "chung," "ting," "tsun," and "i" during the Hsia, Shang and early part of the Chow dynasty had only one or two characters, and at the most 20 or 30. Long inscriptions of two or three hundred characters belong to the later part of the Chow dynasty or to the early Ts'in. There were also genuine vessels of the three dynasties which bore no inscription, for the reason that they were the property of families which had no special merit to commemorate. Such vessels cannot be discarded as spurious. The characters used in inscriptions of the Hsia dynasty were niao chi (bird tracks), those of Shang were ch'ung-yu (insects and fish) while those of Chow were ch'ung-yu and the large "seal" characters. Ts'in dynasty used the large and small seal characters, but from the Han dynasty onward small "seal" characters were used. The three dynasties used sunken inscriptions, while the Ts'in and Han used inscriptions in relief, and occasionally sunken ones, which were incised with tools in the same manner as stone tablets for the reason that this was easier than casting inscriptions in intaglio.

Ts'ao Chung-ming says that the bronze vessels buried in the earth for a thousand years became pure blue like the kingfisher, while those subject to the influence of water for a thousand years became clear green as the rind of a melon. My opinion is that where the soil is warm and moist vessels become blue and where the water is brackish they become green. It is also said that before a thousand years vessels may become blue or green, but not glossy; but I fear that this is not true. How can it be that vessels of a thousand years of age which are glossy, but on which the blue and green colors are not pure, are not properly classed as belonging to the three dynasties? Kao Shen-fu considered that where the metal was comparatively pure and without much alloy the vessels became blue, and that when the alloy was in large proportion they became green. But the ancients were not niggardly in their expenditures, and how can it be thought that they preferred alloyed metals? Such statements are those of a blind man at a theater, and should be discounted. There are those also who maintain that vessels of a dark-brown color have not been preserved in open places, but have come from graves on hillsides or stone vaults where there is no dampness to cause the decaying corpses to influence the color of the metal, and this opinion is probably correct.

The sound given out by ancient bronzes is clear, while that of modern pieces is confused and noisy. Ancient bronzes have no rank odor, except those which have been recently taken from the soil and still retain its smell. Other kinds are spurious. If rubbed briskly with the palm of the hand, a rank odor is given off.

The ancients were not sparing of labor like the artisans of later degenerate times. For this reason the k'uan and chi of ancient bronzes were fine like hairs and were even, regular, and distinct without a trace of being blurred. The characters of the chi were rounding like the surface of inverted tiles and uniform in depth, both when written large or small. The specimens preserved by me all have these characteristics, but I have seen those preserved by others which are different. If the inscriptions are somewhat blurred, such specimens are spurious, and the quality and color of the metal would also be incorrect.

The best color of ancient bronzes, according to some persons, is dark brown, and in my opinion the worst is a leaden color. Those which have red scales are better than the lead-colored ones, but the dark-brown color is still better. The dark-brown color is not so good as the green, nor the green as the blue, nor the blue as those which are iridescent (mercurial), or the iridescent as the black lacquered ones, which, however, have the fault of being easy to counterfeit. Such counterfeits can be readily detected.

BOOK REVIEW

Chinese Encyclopedic Dictionary

Three years ago the Commercial Press put out its New Dictionary, which has become an indispensable reference book. This firm recently published another greater and more complete work known as the Encyclopedic Dictionary to be for the Chinese language what the Century and other similar dictionaries are to English. The work meets a long-felt need. The Chinese language is many centuries old, and its literature has been especially enriched during recent years with the new learning. It still is in process of evolution and many new expressions relating to the sciences, law, medicine, history, etc., have found their Chinese equivalents. New words and phrases are being coined daily to meet new conditions of modern civilization. Therefore, it was necessary to have a dictionary of the new language of modern China, besides that of Confucius.

The work under review is the product of a large staff of scholars, under the editorship of Mr. Lu Erh-kwei, after years of labour. It deals with language and literature, philosophy and religion, astronomy and geology, physics and chemistry, physiology and hygiene, disease and medicine, economics and political science. It contains phrases, terms, idioms and other expressions not found in an ordinary dictionary. Experts and specialists were consulted about the terms used. The definitions are clear and to the point, and the workmanship is excellent. The work is most valuable to students of modern and classical learning, be they foreign or Chinese. It should be in the study of every student of the Chinese language, and no library is complete without it.

Bound in five forms, ranging from Mexican $20 to $5 per set. All bound in two volumes, except the first form, which is in twelve Chinese volumes. The middle form contains 3,094 pages. Publishers, the Commercial Press, Limited, Shanghai.

THE WESTERN ELECTRIC COMPANY

One of the largest manufactories of electrical machinery in the United States and which has a number of successful installations in China to its credit, the Western Electric Company of Chicago, is preparing for the large extension of its business that is already in sight. To enter more strongly into the China trade the company has established a branch office in Shanghai and has taken new and commodious quarters in the Union Building, No. 4 The Bund, Shanghai. Here the company will maintain a show room in which samples of products will be displayed in such a way that the special advantages of Western Electric apparatus can be readily looked into by those interested in any line of electrical machinery that the company manufactures. The branch in Shanghai will be under the direct supervision of Mr. F. F. Fairman and it will hold the sole agency in China while Messrs. Arnold Karberg who formerly held this agency will have no further connection with the Western Electric Company.

SHANGHAI MUNICIPAL ELECTRIC PLANT

FROM ANNUAL REPORT OF ELECTRICAL ENGINEER FOR 1915.

The principal outstanding and satisfactory feature of the past year is the vindication of the Department's policy, financial stability and technical soundness, as agreed upon by Mr. A. H. Preece, and the satisfactory financial position reported upon by the Treasurer. It may be hoped the Department will now be allowed to continue its activities along the path of progress, cleared of the obstacle doubt and paved with confidence for the future.

The other feature, unsatisfactory indeed, is the serious breakdown of the German built turbo-alternators at Riverside. It is not generally known that at one critical period 66 per cent. of the turbine plant was unavailable for service owing to serious defects the development of which had made themselves manifest. But for the incident of the Chinese New Year holidays, when the demand for electricity falls owing to the mills closing, the full supply to the public could not have been maintained. Into the technical causes of these breakdowns it is unnecessary to enter in detail, but enough has been discovered to prove that unsuitable material used in the manufacture was responsible for the trouble. Evidence collected in the United States and England goes to show that the use of the particular metals employed in the construction of the turbine blading was likely to end in disaster. Chemical analysis of the metal conclusively proves that a wrong selection was made in its choice. Two of the machines which developed blade trouble had been in commission only one year and nine months. Other mechanical defects have also since shown up. A serious electrical breakdown also occurred necessitating re-winding part of one of the alternators. This occurred almost simultaneously with the blade troubles and so threw an additional strain upon the Department in maintaining an uninterrupted supply to the public during that period. The best of machines may give some trouble at times, were it otherwise the calling of the engineer would be less obvious, but trouble such as was experienced with the German built machines at Riverside is directly traceable to faulty construction and selection of metals. It may not unnaturally be asked why were these machines selected. The reply is that tenders were, in accordance with the Council's custom, publicly invited. The selected ones were, theoretically, taking price, steam consumption and guaranteed efficiency into full consideration, the best offered for the purpose required, and it would, at the time, have been difficult to have passed them over.

The figures below show the yearly cost in repairs and maintenance of British built machines at Fearon Road Station, in comparison with the German machines at Riverside. The number of years the various machines have been in commission is also given.

Make	Capacity in Kilowatts.	Years in Commission.	Yearly cost in Repairs and Maintenance.
—	—	—	—
			Taels
Parsons	1,000	9	380
Willans and Robinson	1,000	8	396
Belliss and Morcom	600	8	141
do.	600	8	183
Howdens	500	5	343
do.	500	5	423
Allgemeine Electricitats Gesellschaft	2,000	1 year 9 months	2,550
do. do.	2,000	1 year 9 months	2,140

The above figures do not take into account the further losses in the shape of lost revenue resulting in the stoppage of the A.E.G. machines during the time they were under repair. These machines would normally be generating more electricity than the others owing to their greater capacity, thus the loss of revenue was proportionately greater.

Since these turbines were installed trouble with machines of similar make have come to light in connexion with machines in Australia and England. Not only have the German turbines proved defective in Shanghai, but several transformers have also shown marked inferiority to either British or American ones in service. This is not a mere generalisation, the truth of the statement is beyond dispute.

It is hoped these remarks, for which from the purely commercial aspect it would have been preferred there had been no cause, may be carefully studied by prospective buyers and users of electrical plant throughout China. It is not perhaps unfair to claim that on account of the relative magnitude of the Shanghai electricity undertaking and its large foreign staff of engineers, machinery may receive better treatment and more careful supervision than can be given in smaller undertakings either in the outports or interior cities of China. This then leads to the conclusion that nothing but the most reliable machinery should ever be considered for such undertakings.

Notwithstanding the laying up of the Riverside turbines for a considerable time for repairs, by the exercise of care on the part of the acting chief mechanical assistant engineer in charge of the two power stations, and his assistant engineers, the year's working shows a further reduction in the costs of production from last year's figure of tael cents 2.28 to 1.78 or 22%. The greatest reduction is in coal which is the result partly of a cheaper price paid, partly to supervision and again to the lower steam consumption of one of the new 5,000 Kilowatt turbines. The sales of electricity for all purposes increased by 52 per cent.

Analysis of Works Costs

UNITS SOLD AND ACCOUNTED FOR

Account.	1912. 12,130.537 Tls.	Per Unit Cand.,	1913. 21,888,230 Tls.	Per Unit Cand.	1914. 32,885,822 Tls.	Per Unit Cand.	1915 49,827,555 Tls.	Per Unit Cand.	Decrease over previous year Cand.
Coal	137,367	1.13	231,985	1.06	336,186	1.02	420,408	.85	—.17
Oil, Waste, Water and Stores	15,298	.13	22,283	.10	26.128	.08	37,159	.07	—.01
Wages	34,093	.28	52,964	.24	59,972	.18	69,487	.14	—.04
Repairs and Maintenance	97,095	.80	151,902	.69	168,538	.51	190,294	.38	—.13
Rent, Rates and Taxes	11,262	.09	14,277	.07	20,780	.07	24,807	.05	—.02
Management Expenses	86,198	.71	107,604	.49	137,999	.42	144,494	.29	—.13
Total	381,313	3.14	581,015	2.65	749,603	2.28	886,649	1.78	—.50

Had both 5,000 K.W. turbines been in order (*one, it will be recalled, stripped the blading of one wheel and is still running with one wheel short, and taking about 20 lbs. of steam per kilowatt hour as against a guaranteed consumption of 13 lbs.*) a still further reduction in the generating costs would have been remarked. These yearly reductions in Works Costs are indicative of what may be looked for when the new extensions now in hand are completed; they bring nearer to realisation the hoped for reduction in the prices charged for lighting, heating and cooking.

Plant Capacity

The generating plant capacity of the two stations may be taken at 19,600 kilowatts. The storage battery, used in connexion with the traction supply, was scrapped as it was no longer in a serviceable condition. The sale of this battery, consisting principally of lead plates and sheets was most satisfactory, realising a net sum of Taels 14,456. Its book value was Tls. 10,461.

Maximum Load

The maximum load on the two stations was 14,400 kilowatts, and the load delivered to the feeders for light, heat, power and traction 13,909 kilowatts. This fell short of the 15,500 kilowatts estimated at the beginning of the year. It is explained largely by the fact that shortly before the close of the year some of the large mills shut down temporarily, one mill alone accounting for 500 kilowatts, while quite a number of small power users had also stopped operations due to trade depression. It is reckoned that 800 kilowatts can be accounted for from this cause. The traction load remained practically the same as last year.

Load Factor

A remarkable improvement of the Load Factor can be recorded. From the generally accepted good figure of 33.6 per cent of 1914 it has now reached 40.8 per cent. It is but fair to add, however, that the temporary reduction of the maximum load by some 800 K.W. towards the close of the year helped the load factor improvement, but only to a small extent. Had no shrinkage of load occurred more units would have been sold and it may quite safely be said that a 39 per cent. load factor would still have been reached.

Perhaps a better appreciation of the importance of a high load factor may be gathered from the following figures,* which show the units sold per kilowatt by the five largest British municipal electricity supply undertakings and also at Shanghai. They clearly indicate the number of units sold per year for each kilowatt of maximum demand.

Distribution

The actual quantity of underground cable and overhead mains erected was less than during the previous year, but this in no wise reflects lesser activities in the mains department nor a falling off in electricity demand. During the past few years a great extension

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* See Table on next Page.

Comparison of Load Factors of Cities

Year Ending	Undertaking	Units Sold per annum	Maximum Demand in K. W.	Load Factor.	Units sold per kilowatt of Maximum Demand.
1914	Manchester	117,982,802	49,897	26.98%	2,363
1915	Glasgow	88,834,270	39,750	25.51%	2,240
1914	Birmingham	73,767,178	33,177	25.38%	2,225
1915	Shanghai	49,600,824	13,909	40.8%	3,560
1914	Liverpool	48,122,198	22,186	24.76%	2,190
1915	Sheffield	44,873,342	23,618	21.69%	1,900

and enlargement of the distributing system has been carried out, so that in many areas extensions or enlargements should not be necessary for some time. Nevertheless, there are always new areas where distributing mains are required, and from time to time extra high pressure underground feeder cables have to be laid for supplying them, also for meeting the industrial loads which now form such a large proportion of the output.

During the year 119.20 miles of cable have been erected for enlarging and extending the overhead mains and 0.65 miles of E.H.T., 2.13 miles of L.T. and 0.50 miles of pilot cable laid.

New poles numbering 1,414 were erected and 822 renewed.

Transformer Sub-stations

43 additional transformers were put into service totalling 11,606 K. W. Of these 4 were of the oil-cooled pole type=60 K.W. and 39 indoor type=11,546 K.W. while 39 transformers were disconnected totalling 6,212 K.W. of which 3 were oil-cooled pole type=60 K.W. and 36 indoor type=6,152 K.W. The nett increase in transformer capacity is therefore 5,394 K.W. Total capacity of all transformers in service=18,284 K.W.

The new sub-station at Tonquin Road was completed, partly equipped with switchgear and transformer, and put into commission. This sub-station has been designed to supply the surrounding district, which is becoming very largely industrial in character. It is now supplied through four underground 6,300 volt cables, but in the near future additional aid will be effected by means of three 22,000 volt underground trunk feeders. The pressure will then be stepped down from these cables to 6,300 volts for distribution to local feeders, and also to 350 volts for general supply in the immediate vicinity. This sub-station has been designed for dealing with an ultimate capacity of 15,000 kilowatts.

Arrangements were concluded with the French Tramway and Lighting Company for a bulk supply up to 400 K.W. This supply was connected during the year, but up to the present the maximum demand called for by the Company has not exceeded, on the average, more than 228 K.W., but this is likely to be further increased during the current year.

The sub-station work in progress and completed during the year was as follows: Thirteen 3-phase sub-stations erected and commissioned, 3 single phase sub-stations erected and commissioned, 3 3-phase sub-stations dismantled and disconnected, 10 single phase sub-stations dismantled and disconnected, 7 3-phase sub-stations in course of erection. The ultimate capacity of these seven sub-stations at present in course of erection is 10,000 kilowatts.

Public Lighting

Street lamps at the end of the year were:—44 arc and 1,422 metal lamps, made up as follows: 32 enclosed arcs, 12 flame arcs, 801 sixty candle power, metal filament nitrogen lamps, 184 of 100 candle power, 167 of 200 and 270 of 400 candle power.

Practically all the incandescent street lamps are now of the so-called half-watt or nitrogen type. The current consumption of these lamps is approximately .75 watts per candle as compared with 1.2 watts per candle consumed by the ordinary metal lamp formerly in use. The quality of the light emitted from these nitrogen lamps is whiter than from the metal lamps.

During the typhoon last summer serious interruption to the street lighting occurred in those districts where there are many trees alongside the roads. In almost all cases where the lighting was interrupted the cause was traceable to branches of trees having fallen upon or amongst the wires forming the street lighting circuits. In the Central and Northern districts, where there are practically no trees which can come in contact with the wires, very little trouble or inconvenience was experienced as a result of the typhoon.

The partial failure of the street lighting during the typhoon period called forth much criticism, some of which was not altogether fair. In the first place the typhoon was of exceptional severity, and did damage to various other property, etc., which had successfully withstood previous typhoons. It is also to be borne in mind that the prices charged for street lighting are low, and for the price paid, and considering the really rare occasions when failures occur, it has not by any means been proved that the system deserves the strictures passed upon it. The importance of reliable street lighting is indisputable; if a more perfect system is demanded it can be provided by electricity better than by any other known agent. By serving those street lamps, in roads where experience has shown trouble may be caused by trees, by underground cables, a more reliable system would be obtained. It would mean a somewhat increased cost per lamp; the question is whether the existing arrangement does not give—on the whole—a sufficiently good service for the outlying areas, which are the principal ones which have been affected?

4,000 meters were issued for measuring the consumption of electrical energy on consumers premises. This figure represents the nett increase in meters issued during the year after allowing for meters returned for cleaning, repair and from premises disconnected. There were 16,992 meters in use at the end of the year, and 1,092 current limiters. The nett increase in service connexions was 3,149. The total connexions to the mains is 18,104.

Increase in Equivalent 30-watt Lamps

The recorded number of additional 30-watt (equivalent) lamps connected during the year is 92,331 which brings the total connected up to 621,078. These include fans, radiators and cookers, but neither street lamps nor motors, which are usually included in the 30-watt equivalents of most supply undertakings.

Motors

The motors connected and disconnected during the period under review were as under:—

		Aggregating		
Connected	299		4,972	Horse Power
Disconnected	162	,,	2,607	,,
Nett Increase	137	,,	2,365	,,

The total horse power on the mains is now 14,547.

The nett increase of small motor consumers is, under existing conditions, satisfactory, but it is to be noted that many of the smaller businesses failed, or shut down temporarily during the year. With a revival of trade a return to normal conditions may be looked for. The large proportion of disconnections is accounted for by the arrangements made to effect the temporary drive of the Yangtszepoo Cotton Mill during the course of the year. The motors in question totalled some 650 H.P. and were disconnected during August. The work of substituting 3-phase motors for the single-phase type in those districts where change of system of supply has been effected has also been responsible for a large number of apparent disconnections. The prospects for the present year cannot be gauged with any degree of accuracy, but indications justify a belief that there will be a large increase in small motors. With regard to larger power installations, such as the electrification of mills, negotiations have been concluded with the following:—

Dah Yue Oil Mill, 350 horse power; Lih Teh Oil Mill, 230; Poh Yih Cotton Mill 750; Naigai Wata Kaisha No. 3 Mill, 1,500; Foo Foong Flour Mill, 600; Hung Foong Flour Mill, 280; Hung Yue Cotton Mill, 650; Hsen Shing Cotton Mill, 650; Foh Shing (No. 3) Flour Mill, 400; San Sing Cotton Mill, 800; a prospective Total of 6,210 horse power.

The annual totals over the past 5 years were:—

1911, 1,775 horse power; 1912, 3,029 h.p.; 1913, 5,263 h.p.; 1914, 12,181 h.p.; 1915, 14,547 h.p.

Heating and Cooking

Electric heating has now become thoroughly established. The number of additional radiators connected during the year—practically all of which were hired out by the Department—increased by 345. This brings the total number of radiators to 1,216, representing a heating load—if all were in use at the same time—of 2,432 kilowatts.

This form of heating has become popular amongst Foreigners and Chinese alike. The absence of dirt, smell and fumes, and also the portability of the electric radiator are all in its favour; moreover, no flues or chimneys are required, there being no products of combustion to be carried away. Then again, the cheap heating rate of 2.5 candareens per unit still further attracts consumers. Electric cooking has not had an opportunity of expanding because the cooking ranges ordered to meet the demand could not be procured. These ranges, on order for over a year, were not delivered in Shanghai till January this year.

Electricity for heating and cooking is gaining so increasingly in favour, not only in Shanghai but in other countries, that it is no extravagant claim to make that it will supersede other forms wherever the price charged for current is sufficiently low. In discussing the commercial possibilities of electric cooking and heating with Mr. Lackie, the Engineer-in-Chief of the Glasgow Municipal Electricity Department, the writer was given conclusive evidence that in the large area served by the department the progress already made was very considerable and satisfactory. Particulars were given of new building estates whereon electricity is solely employed in domestic use for lighting and cooking.

In the earlier stages of development much disappointment was caused by the unreliability of the heating elements, but these initial difficulties, common to many innovations, have been steadily overcome, and at the present time the appliances, obtainable from the manufacturers who have specialised in this class of work, are very great improvements over the early products.

That such firms as the Carron Co., and the Falkirk Iron Works, firms which have been engaged upon the manufacture of domestic and other cooking ranges for over a century, have laid out sections of their works for the manufacture of electric heating and cooking appliances, it will be the more readily appreciated that the new industry has become a firmly established one.

These remarks are offered in the hope of dispelling the doubts which may still linger in the minds of some that electricity for heating and cooking is merely a fad and a dream of the idealist.

Electrical Units Sold

The total sales of electricity amounted to 49,787,397 which is an increase of 52% over the 1914 sales. The sales for various purposes are here shown together with the increased and decreased percentages over the period 1914.

Private lighting consumption shows a steady increase, whilst public lighting consumption has remained steady; this although over one hundred additional street lamps were connected, by the extended general use of the new half-watt nitrogen metal lamp. The large percentage of heating units furnishes ample proof that electric heating has come to stay. The power sales gain of 101% is noteworthy. It will not be many years before the power units exceed 100,000,000 per annum. Traction units show a small falling off, due to the more effective measures taken by the Tramway Co. to reduce waste of energy on the cars.

	1914.	1915.	percent.
Private Lighting	12,325,247	14,073,166	+ 14.2
Public Lighting	1,055,272	1,005,259	− 4.7
Heating and Cooking	395,675	679,704	− 71.5
Power	15,230,639	30,633,455	+ 101
Traction	3,626,838	3,395,813	+ 6.4
Total	32,633,671	49,787,397	+ 52.6

5,337,824 units were used at the Power Station and otherwise accounted for. This quantity is nearly as great as the total units sold and accounted for in 1909. Of the total number of 62,291,443 units generated Riverside provided 54,845,415. The units used at both power stations directly in the generation of electricity were 5,150,922 or 8.27% of the total. The percentage in 1914 was 9.92%.

Staff

The European staff at the end of the year totalled 76, of whom 18 per cent. are serving with the Colors. In fairness to those remaining in Shanghai it should be known that the majority of eligible men were anxious to follow the example of their confreres, but had they insisted in following their natural inclinations it would have been difficult to have maintained the public service. The Chinese staff at the end of the year was 885.

Financial Returns

The estimated nett profit on the year's working was Tls. 252,051 and that actually made is Tls. 258,909.42. Contributory causes to this excess profit are, the realisation of a better price per unit of electricity sold than estimated, a certain reduction of the salaries owing to engineers, clerks and others being absent on war service, premia on issue of debentures, interest charges less than expected, and depreciation allowance also less. In this latter connexion it should be explained that no reduction in the fixed rate of depreciation has been made, but the amount reserved for special depreciation of Fearon Road Station was corrected to its proper figure, too much having been reserved during the past three years. On the other side, however, the sum of Tls. 9,483 was written off on re-valuation of stores and a further Tls. 7,000 reserved for the same purpose.

The estimated sales of energy and the actual sales are set out below:—

	Units. Estimated.	Units. Actual.
Private Lighting	16,980,000	14,073,166
Heating	554,000	679,704
Power	33,612,600	30,633,455
Public Lighting	1,000,000	1,005,259
Traction	4,000,000	3,395,813

On sales of energy the actual units are 6,358,603 short of the estimate but the actual revenue is less only by Tls. 61,067. As, however, the units sold are less than anticipated so the costs of generation, as represented by the saving in coal used for the smaller output, are also necessarily lower, which has helped improve the nett profit.

Riverside Extensions

A better description of the Riverside extensions can be made after the extension scheme is completed but a few general remarks at the present time will indicate the lines upon which the extensions are to be carried out. The turbine and boiler houses will be of similar construction to the existing buildings, *i.e.* steel frame building with galvanised corrugated iron walls. The turbine room will be 90 feet long by 60 feet wide, and the boiler house 130 feet long by 90 feet wide. Accommodation is being provided for the storage of about 1,000 tons of coal in overhead coal bunkers above the firing floor. Coal will be delivered to these bunkers by means of coal handling plant capable of dealing with 60 tons per hour. The coal can be conveyed direct from the coal store, 11,000 tons capacity, situated between the river and the power station, or direct from the barges by the use of a travelling transporter and belt conveyor. Between the boiler house and turbine room, running the whole length of the building, space is provided in a bay 20 feet wide for the boiler feed pumps, forced draught fans and hot wells on the ground floor level, whilst on the floor above this accommodation is being provided for a mess room and offices for the European staff, and also a mess room and other conveniences for the native staff.

The switch and transformer house will be built entirely of reinforced concrete as a separate annex to the turbine room, the length of this building being 85 feet by 30 feet wide. For the circulating water pumps four additional pump chambers will be sunk in the river adjacent to the existing pump houses. At the present time it is only intended to instal two pumps, but it is considered advisable to sink the pump chambers for future extensions at the same time.

Generating Plant

Two turbine driven generators each of 10,000 kilowatts capacity and one of 5,000 kilowatts capacity are to be installed, thus increasing the plant capacity of the station by 25,000 kilowatts, making the total at Riverside 39,000 kilowatts. The turbines are designed to operate with steam at a pressure of 180 lbs. (boiler pressure 200 lbs. per square inch), superheat up to 200° Fahr. The alternators are designed to generate at a pressure of 6,000 volts, and by means of step-up transformers, connected directly to the generators, the pressure will be transformed up to 22,000 volts. The transformers are designed with an internal reactance of 5 per cent., so that by their use the employment of external reactances, now usually regarded as necessary in big power stations, will not be necessary. It is interesting to note that whilst one of the 10,000 kilowatt turbines will be of the impulse type, such as those already installed, the other 10,000 kilowatt set will be of the Parsons reaction type. These two machines will have to operate under exactly identical conditions, thus there will be excellent opportunities for observing the peculiar merits of the two machines, and enable a first hand experience to be gained with the examples of the two schools of thought on turbine design.

Switchgear

The 22,000 volt switchgear is of special design and arranged with a view to securing the greatest reliability and safety in operation. It is arranged as far as possible so that a breakdown to one part should not seriously affect the other sections. It occupies three separate floors and the lay-out is designed to ensure ease and reliability of operation, and to reduce the risk of fire to a minimum. The switchgear chosen is of an expensive type, but it is fully recognised that switchgear is the most vital part of a station and that it is false economy to cut down the cost of that particular section. The general lay-out of the switchgear is the result of the Department's own ideas, together with improvements which have been suggested from observations made in some of the newest and most up-to-date power stations in Great Britain and the United States, and through the courtesy of prominent engineers who have kindly allowed an examination of the switchgear, plans and designs of projected large power stations with which they are connected. The writer's particular thanks are due to Mr. W. Lackie, Engineer-in Chief of the Glasgow Corporation Electricity Department and Mr. P. V. Hunter of Newcastle-on-Tyne.

Boilers

There will be eight new boilers installed, all of the Babcock and Wilcox water tube marine type, fitted with self-contained superheaters and feed water heaters. Each boiler is designed to evaporate 40,000 lbs. of water per hour at a pressure of 200 lbs. per square inch and at a temperature of 575° Fahr. under normal conditions, but to be capable of giving an evaporation up to 50,000 lbs. with increased draught. For each pair of boilers one steel chimney is being provided, together with an induced draught fan driven either by electric motor or steam engine as may be desired. In addition to this an electrically driven fan will provide forced draught to supplement the induced draught. The method to be adopted is known as the balanced draught system, which is coming into common use in modern stations. Six of the boilers will be fitted with Babcock and Wilcox chain grate stokers, and the two remaining boilers with the Taylor underfeed stoker.

Pumping Plant

Two vertical electrically driven centrifugal pumps, each capable of delivering 20,000 gallons of water per minute against a head of 45 feet, will be installed for the provision of circulating water for the condensers.

Underground Cables

To connect Riverside Power Station with Fearon Road distributing station, four underground cables, each of .15 square inch sectional area, constructed for a working pressure of 22,000 volts, will be laid. These cables will be of split conductor type which type will be adopted for all future extra high pressure cable work in Shanghai, where the importance of the feeders merits the higher cost of these cables over the ordinary 3-core ones. The split conductor system has been decided upon after very careful investigation, the conclusions arrived at being that it offers the best cable protection at present available. The adoption of this system makes it necessary for the switchgear at both Riverside and Fearon Road to be of a rather more expensive type, since the splitting of the conductors necessitates extra switches at both ends of the line.

At Fearon Road Station the current will be transformed down from 22,000 to 6,300 volts by means of step-down transformers similar to the ones to be installed at Riverside but with a smaller internal reactance. Connexion will be made between the existing 6,300 volt switchgear and the transformed current conveyed by the new 22,000 volt underground feeders, which will increase the available output of electricity, at the 6,300 volt distributing pressure, to the various sub-stations in the Central, Eastern and Northern districts. Arrangements are also being made whereby current may be supplied to the Western district at Tonquin Road substation direct from Riverside at 22,000 volts pressure, using Fearon Road as a looping-in and sectionalising point.

22,000 volt switchgear is also being provided for the Fearon Road Station to control that end of the 22,000 volt underground cables and also the step-down transformers interconnecting the two stations. Before this plant can be installed it will be necessary to remove the separately fired superheater and four of the boilers at Fearon Road. This work cannot be proceeded with until one of the 10,000 kilowatt turbines is commissioned at Riverside.

With regard to the choice of 22,000 volts as a transmission pressure for trunk cables, this pressure was selected as the result of much investigation and the collected experience of the working of extra high pressure underground cables. It was selected as being preferable to 33,000 volts suggested in the last Annual Report. Although 33,000 volt cable has been made, it did not appear to offer advantages over the 22,000 volt cable in economy, whereas its adoption would have increased the cost of all attendant switchgear. The conclusion formed was that whereas 22,000 volts is an economical pressure to adopt

33,000 would offer less advantage. After more experience has been gained in the manufacture and use of extra high pressure cables, it is probable that a pressure of 40,000 volts will under certain conditions become standard in the future, where the distance of transmission would make it more economical to use such voltage. So far, the distance over which energy has to be transmitted in Shanghai would not justify the higher voltage, and it may be safely concluded that the adoption of 22,000 volts is the best selection for the local conditions.

Appended is a Report of the various tenders received. The actual contracts placed do not in all cases correspond with the prices shown in the list of tenders. This is explained by the increased cost of raw materials since the tenders were submitted and before the contracts were placed. Other modifications were also necessitated by reason of the additional 5,000 kilowatt turbo-generator, which it was finally decided to provide, but for which no provision was made in the original switchgear or transformer specifications, these having been drawn up for a 20,000 and not a 25,000 kilowatt extension. Therefore additional switchgear and transformer capacity and larger circulating water pumps have to be provided which, together with increased costs, have made the contract prices come up to the figures shown in the list of actual contracts placed.

Extensions

Joint Report by Mr. A. H. Preece and Mr. T. H. U. Aldridge on Recommendations relating to the placing of orders for New Plant. The following tenders were received on Steelwork for Buildings:—

Steel Work Tenders

	Price. £	*Delivery.* Weeks.
United States Steel Products Co.	8,026 (@ G. $4.7 = £1)	12
Lysaght, Ld.	12,939 8. 0.	26
Head Wrightson & Co.	14,198 11. 1.	36
P. & W. McLellan	Schedule only	48

The tender of the United States Steel Products Co., is recommended for acceptance.

Turbo-Alternators Tenders Received

Firm	Alternator	K.W.	Speed R P.M.	Price £	Delivery Weeks	Full Load Steam lbs.	£ per K.W.
—	—	—	—	—	—	—	—
Fraser and Chalmers	Vickers	5,000	3,000	16,009	27	13.0	3.2
Escher Wyss	Brown Boveri	5,000	3,000	16,448	26	12.62	3.36
Willans & Robinson	Siemens	do.	do.	16,730	52	12.85	3.34
Oerlikon	Oerlikon	do.	do.	16,950	30	12.78	3.38
Dick Kerr	Dick Kerr	do.	do.	18,036	—	13.2	3.6
D. Adamson	Siemens	do.	do.	18,394	52	13.8	3.67
C. A. Parsons	Parsons	do.	do.	18,555	44	12.25	3.7
Richardsons-Westgarth	Siemens	do.	do.	18,860	52	12.52	3.76
Howden & Co.	Siemens	do.	do.	18,900	38	13.6	3.76
Willans	Siemens	6,000	1,500	19,927	36	12.75	3.34
Westinghouse	Westinghouse	5,000	3,000	21,136	33	15.0	4.23
Oerlikon	Oerlikon	7,000	do.	21,449	30	12.71	3.06
Belliss	Vickers	do.	1,500	23,619	35	13.05	3.37
Brush Co.	Brush	6,000	do.	24,010	47	12.9	4.0
Howden & Co.	Vickers	7,500	do.	34,605	48	13.05	3.3
General Electric Co. (U.S.A.)	G. E. Co.	do.	do.	25,750	30	12.55	3.43
Dick Kerr	Dick Kerr	8,000	do.	27,406	—	13.1	3.42
Fraser & Chalmers	Vickers	10,000	do.	27,427	50	12.75	2.74
B. T. Houston Co.	B. T. H.	do.	do.	27,554	39	12.5	2.75
Willans	Siemens	do.	do.	28,362	52	12.55	2.83
Escher Wyss	Brown Boveri	do.	do.	30,550	40	12.65	3.05
Howden & Co.	Siemens	do.	do.	31,690	52	12.95	3.16
General Electric Co. (U.S.A.)	G. E. Co.	do.	do.	31,720	32	12.85	3.17
Oerlikon	Oerlikon	do.	do.	31,913	37	12.61	3.19
C. A. Parsons	Parsons	do.	do.	32,605	52	11.9	3.26
Westinghouse (U.S.A.)	Westinghouse	do.	do.	33,780	25	13.5	3.37
Richardsons-Westgarth	Siemens	do.	do.	33,984	52	12.5	3.39
Adamson	Siemens	do.	do.	35,654	60	12.8	3.56
Brush Co.	Brush	do.	do.	39,710	72	12.65	3.9

The conclusions arrived at as to the most suitable sized units of plant, having regard to cost, efficiency, space occupied as affecting buildings, foundations, pipework, etc., are these:

Two sets each of 10,000 kilowatts output would be the best selection, but in view of the longer time machines of this size would be in building, the greater difficulties of handling and longer period for erecting them on site, as compared with a 5,000 K.W. set, it is deemed advisable to recommend that one machine of 5,000 K.W. should be ordered. It being recognised that additional plant is urgently needed, and whilst the introduction of a 5,000 K.W. unit may not represent the best engineering or commercial practice, the times are such that in order to more certainly ensure continuity of supply to consumers, it is safer in the general interests to secure a set of this size in order to meet the increasing demands on the power station. All things considered there is more likelihood of getting a machine of this size built, shipped and put into commission quicker than a 10,000 K.W. set. Assuming that this machine can be ready for service in August next year it would then be possible to meet the 1916 winter load, although the station would not have a full margin of reserve plant installed unless one of the larger sets, which should also be ordered, is also ready. Nevertheless the purchase of a 5,000 K.W. set would undoubtedly place the Department in a safer position in so far as it would enable the 1916 demands to be met. With regard to the permanent economical value of the set no apprehension need be felt since the guaranteed steam consumption is satisfactory, and the cost per kilowatt is £3.2 as compared with £3.17 and £3.26 for 10,000 K.W. machines. Summarising the position it may be stated that whereas in normal times, or, if there was no great hurry for additional plant, we should advise the installation of two 10,000 K.W. machines only, existing circumstances justify a departure in order to meet the exigencies of the situation.

To provide for the balance to make up the station capacity to 20,000 K.W. the following suggestions are made: That inasmuch as the buildings can accommodate two 10,000 K.W. units in addition to the proposed 5,000 K.W. set, and in order to further postpone another large extension of the power station buildings in a few years' time, we consider that the installation of two 10,000 K.W. sets would best meet the case. This will give an increase of 5,000 K.W. above the original 20,000 K.W. proposal, but with the adequate boiler plant which it is proposed to install, together with existing boilers, full use of this additional capacity can be made. Should our proposals be agreed to we recommend ordering one 10,000 K.W. machine for delivery next year, and the second one for delivery in the spring or early summer of 1917.

The following tenders are selected for the Committee's approval:—

Messrs. Fraser & Chalmers, London, one 5,000 K.W. turbo-alternator turbine by Fraser & Chalmers. Alternator by Messrs. Vickers, Ld., Price, £16,009—delivery 27 weeks—Steam consumption 13 lbs. per K.W. hour.

Messrs. Parsons & Co., Newcastle-on-Tyne, one 10,000 K. W. turbo-alternator. Price £32,605—Delivery 52 weeks—Steam consumption 11.9 lbs. per K.W. hour. The General Electric Co. of New York one 10,000 K.W. turbo-alternator. Price £31,720—Delivery 32 weeks—Steam consumption 12.85 lbs. per K.W. hour.

The selection of Messrs. Parsons' tender, although not by any means the lowest, is due to the fact that this firm has already built machines of this size and over—one of 25,000 K.W. for the Chicago Edison Co., and that the very low steam consumption guaranteed more than compensates for the higher price of the plant. It is estimated that under ordinary conditions of working, such as pertain at Riverside, a saving of some £6,000 per annum on the coal bill would be effected when compared with the performances of other machines offered. In other words, the low steam consumption represents a saving of £6,000 per annum which more than wipes off the higher first cost of the machine. If time were of no importance we should advise placing the order for both 10,000 K.W. sets with Messrs. Parsons, by so doing a large annual saving on the coal bill would be obtained.

Instead of calling for tenders for the boiler plant Messrs. Babcock & Wilcox were asked to submit a complete tender for 8 boilers, chain-grate mechanical stokers, feed water heaters, artificial draught plant and steel chimneys. All the existing boiler plant at both Fearon Road and Riverside, with the exception of two old boilers, is of Babcock & Wilcox make. It has given satisfaction and we are of opinion that for power station purposes there is no better boiler than this firm's marine type. The prices have been carefully checked against those charged for similar boiler plant in other power stations and allowing for the increased costs due to the war, the tender submitted is a fair one and the prices are not higher than might be expected.

All the existing boilers in the Council's power stations are fitted with the Babcock & Wilcox chain-grate mechanical stoker. The tender includes such stokers for the eight new boilers. Evidence collected in the United States and in England shows that for certain classes of coal and for certain operating conditions, a stoker of the underfeed type presents what appears to be advantages over the chain-grate stoker in that it enables a larger overload capacity to be obtained from the boiler than is possible with the chain-grate type. If the claims made for this stoker can be fully substantiated its slightly higher cost would justify its adoption for the whole of the new boiler plant. Investigations made by Mr. Aldridge in New York, Boston, Pittsburgh and Glasgow show that this stoker finds much favour. We do not, however, recommend its adoption for all the boilers and consider it would be advisable to equip only two of the eight boilers. If its claims are fully borne out by experience, and if it is as satisfactory with local as with certain British and American coals, then in future extensions this type may be adopted, or some of the existing chain-grate stokers at Riverside may later on be changed. The recommendations with regard to the boiler house plant are :—

Messrs. Babcock & Wilcox, Ld., London, 8 Marine type water tube boilers complete with feed water heaters, Chain-grate mechanical stokers for 6 boilers, Induced and forced draught fans, etc., for 6 boilers, Three steel chimneys, Pipework, etc., etc. Price £65,217—Delivery Glasgow—26 weeks 1st portion, 39 weeks 2nd portion. Messrs. Scholey & Co., Ld., London, Taylor underfeed stokers for 2 boilers, Induced and forced draught fans, etc., for 2 boilers, One steel chimney for one pair of 2 boilers. Price £5,370—Delivery New York—26 weeks.

Coal Handling Plant

The following tenders were received :—Bennis & Co. £7.340; Fraser & Chalmers £9,817; Strachan & Henshaw £11,395; Babcock & Wilcox £18,238; Spencer & Co. £27,885:

It will be observed that there is a very large discrepancy between the lowest and the highest tender. The lowest tender submitted by Messrs. Bennis & Co. does not provide for the carrying of the transporter bridge. As under their scheme it would be necessary to construct high concrete walls for supporting the transporter bridge, the cost of these would bring the price of the complete coal handling plant up above the second tender, moreover, the general lay-out as regards coal handling facilities is not, in our opinion, as good as the next lowest tender. We recommend the tender of Messrs. Fraser & Chalmers for acceptance. Some slight additional cost may be necessary as Messrs. Fraser & Chalmers have not adequately provided for coal weighing apparatus but a sum of £200 should be sufficient to cover this.

For Extra High Pressure Switchgear for Riverside (22,000 Volts)

The following tenders were received:—Westinghouse Co. Pittsburgh £5.600; Ferguson Pailin & Co., Ld. £6.380; General Electric Co. (New York) £7,116; British Thomson-Houston Co.. Ld. £7.233; Bertram Thomas £8,950; Switchgear & Cowans, Ld. £9.515:

The tender of the British Thomson-Houston Co., Ld., at £7,233 is recommended for acceptance. In connexion with this recommendation a few remarks in explanation of the reasons for advocating the acceptance of this tender are given. It is of the utmost importance that the switchgear of the main generating station and also at the important Fearon Road sub-station should be of the highest quality, as the successful operation of electricity supply depends very largely upon the switchgear.

The tender of the Westinghouse Co. of Pittsburgh is considerably lower in price, and the lay-out, although not in our opinion as good as the British Thomson-Houston Co.'s. which adheres in almost every detail to the design prepared in the Specification, is nevertheless a good one, but from experience we know that in placing orders for large and important switchgear such as this, modifications are often necessary from time to time during construction, and we feel that it is better to place the order with a firm who are in direct touch with the London office.

There is also another reason for preferring the British Thomson-Houston Co.'s offer, inasmuch as this Company has carried out a considerable amount of work in England in connexion with cable control designed on what is known as the split conductor system (which will be referred to later in this report when dealing with the underground cable contracts). This system, as far as we know, has only been applied in Great Britain, and on schemes designed by British engineers, and is not used in America. We consider it advisable to place the order for this important work with a firm which has already manufactured similar types of split conductor apparatus.

For the above reasons, having carefully considered the various tenders, we recommend accepting that of the British Thomson-Houston Co. of Rugby, at a total cost of £7,575. this figure it will be observed is higher than shown in the above list of tenders, viz. £7,233. this additional cost is entailed by our adoption of the split conductor cable system. If all the other tenderers re-quoted for split conductor switchgear their prices would be proportionately increased.

High Pressure Switchgear for Fearon Road (6,600 Volts)

The following tenders for this apparatus were received:—British Thomson-Houston Co., Ld. £1,565; Ferguson, Pailin & Co., Ld. £1,685; Westinghouse Co., Pittsburgh, £2,015; We again recommend acceptance of the British Thomson-Houston Co.'s tender.

Extra High Pressure Switchgear for Fearon Road (22,000 Volts)

Under the original scheme no provision was made for 22,000 volt switchgear at Fearon Road, because it was intended to connect the trunk feeders direct to the step-down transformers and control the switching operations on the cables from the 6,600 volt side only. Saving in cost was the prime motive for adopting this arrangement, but after the specifications for cable were issued it was found that similar protective apparatus to that which is already employed on four of the existing trunk feeders between Riverside and Fearon Road, which it was intended to again adopt in this case, could not satisfactorily perform similar functions when used with step-down transformers interposed. It. therefore, became necessary to amplify the switching arrangements at Fearon Road by the introduction of 22,000 volt switchgear in addition to 6,600 volt switchgear. As this apparatus has to work on the split conductor system, and in view of our recommendations that the Riverside switchgear should be given to the British Thomson-Houston Co., we consider it advisable to place the order with the same firm. It is not of such expensive design as the main switchgear at Riverside, but for technical reasons this is not necessary. The final arrangements for this apparatus had not been concluded when Mr. Aldridge left London, and prices are not yet to hand because the final arrangement has only just been decided upon here. It is estimated that the cost of this switchgear will be about £3,000.

Circulating Water Pumps for Condensers

The following tenders were received :—

	Price.	Maker of Motor.
	—	—
	£	
Drysdales, Ltd.	5,407	
Worthington Pump Co.	5,417	E. C. C.
Rees Roturbo Co.	5,537	E. C. C.
Rees Roturbo Co.	5,743	Crompton.
Mather & Platt. Ltd.	5.976	Mather & Platt.
Gwynnes	*3,404	Westinghouse.

*Does not include steel pipes.

With regard to the above tenders which include the steel pipe between the pump house on the river and the turbine room, the price for the steel pipework in the different tenders varies considerably, and we therefore consider that it would be better to eliminate this item from these tenders and obtain new tenders for the pipework direct from the manufacturers of pipes. Eliminating this pipework the tenders come out in the following order :—

Drysdales	£3,157	
Gwynnes	3.404	
Worthington (H.P. each 290)	3,474	£6 per H.P.
Mather & Platt (H.P. each 400)	3,697	£4.6 per H.P.
Rees Roturbo	3,862	
Rees Roturbo (alternative)	4,113	

In these specifications details of the amount of water to be pumped and frictional head, etc., were given, but no two tenderers have put in offers to exactly the same conditions. The two lowest tenders, viz. those of Messrs. Drysdales and Gwynnes, do not provide sufficiently large pumps and motors for driving them as in our opinion would fulfil the requirements called for in the specification. With regard to the two next tenders, viz. those of the Worthington Pump Co. and Messrs. Mather & Platt. the former provide only 290 H.P. for driving each pump whereas the latter provide 400 H.P., therefore, the bigger plant would in practice be preferable because it would allow a bigger margin of safety at very low tide, also when the condensers are dirty and more power is required to force the water through them. If the two tenders are regarded in cost per H.P. provided, then the Worthington Pump Co.'s works out at £6 per H.P. and Mather & Platt's at £4.6. This being so, the latter is really the cheaper plant. As to the design and workmanship of the two firms, there is practically nothing to choose, we recommend the acceptance of Messrs. Mather & Platt's tender at £3,697, as this, without paying appreciably more for it, would give a bigger margin of safety and pump a greater quantity of water under the worst conditions that may obtain at Riverside.

Static Transformers

The following tenders were received to the specification for transformers :—

	Price.
	—
	£
Westinghouse Co.—G. $59.276	12,300
General Electric Co. of New York	18.874
British Electric Transformer Co.	22,031
Oerlikon Company	*23,050
Brush Electric Engineering Co.	26,304
Ferranti Ltd.	†12,546

*Does not include oil.

†Quotation is for a portion only of the Transformers.

The inclusion of a 5,000 K.W. set has necessarily increased the number of transformers required at Riverside, furthermore the necessity of having 22,000 volt switchgear at Fearon Road makes advisable a different grouping of transformers and an alteration in the size of some of them. The total transformer capacity to be provided is 76,000 K.V.A. and the estimated cost is approximately £15,890.

The tender of the Westinghouse Co. of Pittsburgh is recommended for acceptance, the price being very considerably lower than the next tender, viz. that of the General Electric Co. of New York. The efficiencies and guarantees given are equally as good as those given in any of the other tenders and we consider that this firm's tender should be accepted. Modifications brought about by the addition of the 5,000 K.W. set and the re-grouping of the transformers differently to the scheme at first drawn up, means getting some 3,000 K.V.A. transformers which were not called for in the specification. The price of these has been estimated as closely as possible. With the exception of five transformers required for raising the pressure of the two existing cables connecting Fearon Road and Tonquin Road sub-stations, which are urgently required, the others are not really necessary until the end of the year, as until some of the boilers can be removed from Fearon Road there will not be room for installing the transformers in the space set free.

Extra High Pressure Underground Cables 22,000 Volts

The following tenders were received to the specification calling for 40,000 yards of cable together with jointing boxes, etc.

	Schedule A	Schedule B
	—	—
	Actual Tender	Adjusted
	£	£
Standard Underground Cable Co.	33,904. 0.5	34,727. 5.0
Siemens Brothers	37,227.15.0	36,666.15.0

British Insulated & Helsby Cables Co.	38,272. 6.0	38,251.10.0
Johnson & Phillips	38,818. 0.0	38,980. 7.8
W. T. Henley's Telegraph Co.	40,355.10.0	39,838. 5.0
Pirelli, Ld.	37,845. 2.0	39,893. 5.4
Western Electric Co.	41,449.12.4	41,395.11.6
Callenders Cable Co. (Joint boxes split horizontally)	43,944.12.0	43,456.12.0
Callenders Cable Co.	44,303.14.0	43.815.14.0
Union Cable Co.	47,400. 0.0	46,864. 0.0
W. T. Glover & Co.	47,835. 6.6	47,533.12.6

Schedule A shows the prices as received. Schedule B shows the prices adjusted, to a common price of copper and lead, which is really a truer comparison of the relative tenders. In the section of this report dealing with extra high tension switchgear, mention was made of the adoption of the split conductor system of cable protection. In this connexion it should be explained that the original specification for underground cable was drawn up for 3-core cable, which was to have been protected by apparatus similar to that already installed on some of the existing underground cables. Only after these tenders had been received it was found that owing to the interposition of step-down transformers at Fearon Road, the system would not be satisfactory. Very careful investigation leads us to the conclusion that the best system at present in use is that known as the split conductor system, which, from the experience so far known, gives greater reliability in service than other systems in use. Whilst many electricity supply undertakings have more or less satisfactorily carried on with protective gear as in use in Shanghai, it has been found that when such undertakings become very large phenomena occur which in the smaller systems are not met with. The efficient protection of cables and their attendant switchgear is a matter which has received a great deal of attention during the past few years. Great damage may be caused, not only to the cables themselves, but to other parts of the plant, by cables breaking down. A system, which instantaneously cuts off the current from such cables when they are damaged, may save thousands of pounds of damage to other apparatus and plant. In view of this, therefore, we consider it advisable to incur the additional cost of split conductor cables, regarding such expenditure as an additional insurance against interruption to the supply and loss of money consequent upon damage.

The manufacture of split cables is at the present time more special than ordinary 3-core cables, and as far as we know has not been made by more than a few of the firms who quoted to the original specification for 3-core cable. It having been decided to recommend the Council to use split conductor cables, the three following firms were asked to submit tenders for the supply of such cable, viz:—Messrs. Siemens Brothers, Henleys and the British Insulated & Helsby Cables Co., Ltd.

Siemens Bros.	£ 41,058
British Insulated & Helsby Cables Co.	43,490
Henleys, Ltd.	43,900

We recommend acceptance of the British Insulated & Helsby Cables Co.'s tender.

Pipework

There is still a certain amount of pipework for which tenders should be called, but specifications for this cannot be issued until the final drawings of the boilers and steam turbines are received from the builders. As soon as these drawings are received the final lay-out of the plant can be completed, the pipework can then be ordered to fit in with these arrangements.

T. H. U. ALDRIDGE,
A. H. PREECE.

GENERAL CONDITION OF FINANCE AND ECONOMY IN JAPAN IN 1914-15

The General Budget for the Financial Year 1914-15 which was presented at the thirty-first session of the Diet failed to pass owing to differences between the two Chambers respecting the Warships Construction Vote, and the Government was compelled by the provisions of Art LXXI of the Imperial Constitution to carry into effect in the new year the Budget of the preceding year. And accordingly the Government, following precedents, framed within the limits of that budget a sort of self-denying working budget, which put the total revenue at yen 654,282,173 (£ 67,016,509) and the total expenditure at yen 559,759,598 (£ 57,334,794), thus giving a surplus of yen 94,522,575 (£ 9,681,661). At its thirty-second, thirty-third, and thirty-fourth sessions, the Diet passed the votes of yen 1,230,000 (£ 125,986) for the funeral expenses of the Empress Shoken and yen 6,520,000 (£ 667,828) for warships construction expenses and assented to the transfer of yen 51,000,000 (£ 5,223,804) to the extraordinary military expenses special account in consequence of the opening of hostilities with Germany and of yen 2,000,000 (£ 204,855) to the war reserve fund for 1914, making a total of yen 60,750,000 (£ 6,222,473). Moreover, yen 2,490,000 (£ 255,045) was added to the working budget for transfers to the sinking fund and for various repayments and other purposes, and at the same time, in order to carry out the policy of financial retrenchment in regard to the war, the general expenditure was curtailed and undertakings to be executed with continuing expenditures were postponed. By these means the annual expenditure was reduced by yen 2,160,000 (£ 221,243) and the revenue augmented by yen 32,000 (£ 3,278), with the result that the total revenue stood at yen 654,310,000 (£ 67,019,359) and the total expenditure at yen 623,850,000 (£ 63,899,416), thus yielding a surplus of yen 33,550,000 (£ 3,436,444).

Upon comparing the actual results of the revenue for the Financial Year 1913-14 with the Budget estimates, we find that in the ordinary section there was an increase of yen 32,530,000 (£ 3,331,968) in taxes and duties, mainly owing to increased revenue from Customs duties, sugar excise, and *sake*, income, and business taxes, and an increase of yen 1,750,000 (£ 179,248) in stamp duties, and in regard to Government undertakings and State property, although there was more or less decrease in the revenue from posts, telegraphs, and telephones, there was an increase principally in the profits of the Monopoly Bureau, Steel Foundry, and Tokyo and Osaka Arsenals, which gave a net increase of yen 8,970,000 (£918,775), making the total increase in the ordinary section yen 42,200,000(£4,322,442). In the extraordinary section, there was a decrease of yen 4,870,000 (£ 498,822) in the transfer to the waterways improvement fund and of yen 2,530,000 (£ 259,142) in the public loan proceeds and other items; but on the other hand, there was an increase of yen 87.170,000 (£ 8,928,608) in the surplus brought over from the preceding year and yen 5,500,000 (£ 563,351) in miscellaneous receipts, showing a net increase in the extraordinary section of yen 85,350,000 (£ 8,742,190). Thus, the total ordinary and extraordinary revenue came up to yen 721,970,000 (£ 73,949,606), being an increase of yen 127,550,000 (£ 13,064,632) on the estimated total revenue, which had been put at yen 594,410,000 (£ 60,883,950). It should be added that the increase of yen 42,200,000 (£ 4,322,442) in the ordinary section takes into account the increase of yen 2,290,000 (£ 234,559) in the ordinary revenue in consequence of administrative adjustment and the decrease of yen 9,140,000 (£ 936,188) in the revenue as a result of the adjustment of the tax system, so that the natural increase in the ordinary section really amounted to yen 49,050,000 (£ 5,024,070).

Next, although the time has not yet arrived for ascertaining the actual results of the revenue for 1914-15, it is anticipated that in the ordinary section, when compared with the figures of the working budget, there will be a decrease of about yen 13,630,000 (£ 1,396,087) in the Customs receipts in consequence of the great war, and while there will be a decrease in the receipts from the textiles consumption and bourse taxes, there will be an increase in the receipts from sugar excise, and income, *sake*, and business taxes, so that there will be a net increase of yen 2,350,000 (£ 240,705) in the revenue from taxes and duties; and as regards the Government undertakings and State property, while there will be a decrease in the receipts from posts, telegraphs, and telephones, and from forests, an increase is anticipated in the profits of the Steel-Foundry, Government Printing Office, Tokyo and Osaka Arsenals, Senju Woollen Manufactory, and Monopoly Bureau, dividends, &c., so that there will be a net increase of yen 1,970,000 (£ 201,782); but as there will be a decrease of about yen 1,750,000 (£ 179,248) in stamp receipts, besides decreases in some other items the total net increase will be yen 2,030,000 (£ 207,928). In the extraordinary section, there will principally be an increase of yen 71,420,000 (£ 7,315,374) in the surplus brought over from the preceding year, and there will also be an increase in the proceeds of sale of State property, so that the total increase will be about yen 78,160,000 (£ 8,005,736). Accordingly, the total ordinary and extraordinary revenue will come up to yen 734,510,000 (£ 75,234,047), being an increase of about yen 80,200,000 (£ 8,214,688) on the total revenue given in the working budget which amounts to yen 654,310,101 (£ 67,019,369).

In the Financial Year 1914-15, while, on the one hand, there was, in consequence of the great war in Europe, a considerable reduction in revenue and also in the annual expenditure, a large amount of extraordinary expenses was required in the same connection, efforts were made on the other hand to strengthen the financial basis by strenuous adjustment of finance and administration, curtailment of expenditures, and postponement of undertakings. A change was made in the financial year for deferred payments for monopoly goods and the relations between the receipts and disbursements of the National Treasury were improved. And as through these measures there was always a large surplus in the National Treasury, no need was felt at all during the financial year under review for the issue of Treasury bills.

A Brief Account of the Economic Condition

The following are the principal events in the Japanese economic world in 1914:—

The economic world in 1913 required a large amount of capital, as has been explained in the Financial and Economic Annual for 1914, on account of the progress of already-planned undertakings and for the settlement of the balance of foreign trade, with the result that the money market was on the whole in a tight condition. In the first half of 1914 the money market continued to be in the same condition: especially in February and March, as a result of many political dissensions in the Diet, the financial world took up a cautious attitude, and there was from January onward, a decrease, as compared with the same period of the preceding year, in the amount of new undertakings planned, amount of increase in nominal and paid-up capitals, amount of debentures issued, and volume of foreign imports; the issue of convertible notes by the Bank of Japan was also continually lower than in the same period of the preceding year, and prices continued to fall.

At the end of March the General Budget for the Financial Year 1914-15 failed to pass the Diet and the Cabinet resigned in a body. In the middle of April the present Cabinet was formed. Soon after its formation the new Cabinet recognised the necessity of changing the financial policy which had up to that time been followed, especially in regard to public loans, and decided not to raise new loans either at home or abroad. In consequence, it was resolved, in regard to that portion of the fund for the construction and improvement of State railways which required to be borrowed, to reduce the amount annually set apart for redemption of loans from yen 50,000,000 (£ 5,121,377) to yen 30,000,000 (£ 3,072,826), and to loan the difference, that is, yen 20,000,000 (£ 2,048,551) from the general account to the railway account, and to pay in future out of the general revenue the money which had till then been obtained by means of public or temporary loans for the construction of railways in Chosen and repairing of rivers in Japan Proper; and at the same time plans were formed to use a large portion of the general account surplus (amounting at the time to yen 120,000.000 (£ 12,291,304)) which had accumulated from the preceding year as a result of financial and administrative adjustment and had not yet been specified for definite use, as a fund for a change of the terms for the payment of taxes and duties and suspension and transfer of already-fixed temporary loans; in this manner the receipts and disbursements of the National Treasury were to be harmonised, the issue of Treasury bills to be reduced, and appropriate reduction of taxes to be effected. While the above plans were to be carried out, the question of specie reserve was to be left to natural economic agency and to the sense of self-preservation on the part of the Bank of Japan, and thus the Government made clear its intention not to import foreign capital itself.

This financial programme won general admiration as one suited to the times; but as it was deemed that its effect would be great upon our economic world which had always been comparatively easily affected by financial movements and upon the financial world which had for many years been annually importing large amounts of foreign capital, the Bank of Japan raised its discount rate on the 6th July from 6.57 per cent. to 7.3 per cent. per annum and thus kept step with the new policy of the Government.

At the end of July, however, the sudden outbreak of war on an unprecedented scale among the great European Powers caused such a shock to the financial and economic circles of the whole world that they fell into a panic; and it was only natural that our country should also be seriously affected by it. The principal effects in Japan were the danger to navigation, rise of marine insurance rates, reduction and difficulty of importation and exportation, changes in foreign exchange rates and difficulty in drawing exchange bills, sudden fall in price of raw silk and cotton yarns, our most important articles of export, and rise in price of dyestuffs, chemicals, and many other articles of import. These effects were most marked in the early days of August.

Our financial and economic condition at the outbreak of war may be summarised as follows:—

1. There was a large surplus in the National Treasury;
2. There was no need for raising a public loan in order to carry the Budget into effect;
3. There was no intention to rely upon foreign capital for future financial operations;
4. The general economic world was already in a cautious attitude on account of the raising of the discount rate by the Bank of Japan on the 6th July;
5. The circulation of currency having gradually contracted since the preceding year, the issue by the Bank of Japan of its convertible notes beyond the prescribed limit as had for a long while been the case, ceased altogether and its resources comparatively large;
6. The balance of foreign trade improved considerably, and the excess of imports was rapidly being reduced as compared with the preceding year.

As the country was thus in a condition as if it had purposely prepared itself for an emergency, the general economic world was strong enough to oppose the effects of the situation. Accordingly there was no need in our country to adopt such extraordinary economic measures as were taken by many countries of the world, like suspension of conversion of notes by the central bank, prohibition of exportation of gold coin and bullion, moratorium, issue of emergency paper money, and various restrictions upon bourses. The only steps taken in this connection were the Government guarantee of war marine insurance and accommodation by the National Treasury of a capital of yen 8,000.000 (£819,420) for the relief of producers of raw silk and other important articles of export who were suffering from a heavy fall in market prices and sudden diminution of sale. Even the discount rate of the Bank of Japan was not raised at all after the outbreak of war.

Although upon the rupture of diplomatic relations with Germany on the 23rd August, our army proceeded to seize Tsingtau and our navy took hostile actions in various parts of the Pacific Ocean, our financial condition being as above stated, we were able to defray our war expenses entirely out of the surplus revenue and therefore we did not need not only to raise a loan or increase taxes to meet the expenses of our war with Germany, but even to issue Treasury bills. Although it had for many years been usual to have large amount of Treasury Bills outstanding, such amount altogether disappeared from the middle of February, 1914, to the end of the year. Only, as the surplus was, in consequence of the war with Germany and the European war, applied to purposes other than those planned for, it was eventually found impossible to use it for the reduction of taxes, change of the terms for the payment of taxes, and other purposes as had been originally planned.

Navigation, foreign exchange, foreign trade, and production of articles of export were seriously affected by the outbreak of war in Europe; its effects were also more or less felt in the general economic world, and the financial world maintained in the latter half of the year the attitude of caution which it had assumed in the former half.

The statistics showing the activities of the economic world under the influences above referred to reveal a decrease in every respect in 1914 as compared with the preceding year, thus:

1. The average issue for the whole year of the convertible notes of the Bank of Japan was yen 315,000,000 (£ 32,264,673), a decrease of yen 19,000,000 (£ 1,946,123) on the preceding year;
2. The amount of newly-planned undertakings was yen 250,000,000 (£ 25,606,883), a decrease of yen 130,000,000 (£ 13,315,579) on the preceding year;
3. The increase of the nominal capital of companies was yen 162,000,000 (£ 16,593,260), which was less than that in the preceding year by yen 109,000,000 (£ 11,164,601);
4. The increase of the paid-up capital of companies was yen 165,000,000 (£ 16,900,543), which was less than that in the preceding year by yen 13,000,000 (£ 1,331,558);
5. The issue of debentures amounted to yen 52,000,000 (£ 5,326,232), which was less than that in the preceding year by yen 12,000,000 (£ 1,229,130);
6. The average index number of prices of commodities in Tokyo was 4½ less than in the preceding year.

Further, a special phenomenon of the year was the unprecedented crop of rice, the product of our most important industry, and principal foodstuff of our people. Its production amounted to 57,000,000 *koku*, which was 7,000,000 *koku* in excess of the crop of a normal year. In consequence, its price which had been yen 22.80 (£ 2. 6*s*. 9*d*) in the early part of January, 1913 and yen 20.10 (£ 2. 1*s*. 2*d*) in the corresponding period of the succeeding year in the rice market of Tokyo fell by the end of the latter year to yen 11.60 (£ 1. 3s. 9*d*), which was such a heavy blow to the agricultural classes that an agitation arose in the Diet for their relief, the measure proposed being that the National Treasury should buy up a large quantity of rice in order to prevent the fall of its price.

Foreign trade also was affected by the influences above mentioned. The volume of imports was less than in the preceding year by yen 134,000,000 (£ 13,725,289) and stood at yen 595,000,000 (£ 60,944,382), and the exports were also less by yen 41,000,000 (£ 4,199,529) and stood at yen 591,000,000 (£ 60,534,672); thus the total trade amounted to yen 1,186,000,000 (£ 121.470,054) and showed a decrease of yen 175,000,000 (£ 17,924,818). The excess of imports over exports which was yen 97,000,000 (£ 9,935,471) in 1913 fell in the following year to yen 4,000,000 (£ 409,710), a decrease of yen 93,000,000 (£ 9,525,761).

Such a decrease of both imports and exports in one year is an anomaly that has not happened in the last quarter of a century, with the sole exception of that which occurred in 1908 after a panic in America. It is attributable partly to the European war and partly to the condition of the economic world at home; and this great decrease in the excess of imports was of material assistance in the solution of the specie question.

JAPANESE LIME FOR PHILIPPINES

The establishment of sugar centrals in the Philippines has stimulated interest in the industry of supplying hydrated lime for use in the refining processes. Inquiries have been received concerning the feasibility of importing hydrated lime from the United States, and requests made for data as to the sources from which the lime is now obtained.

The local lime industry is still in embryo, although there are abundant deposits of limestone, as well as excellent marble deposits such as those of the Romblon fields. Up to a few years ago all the lime produced here was made by Chinese burners, who gathered sea shells heavily loaded with sand, from deposits along the shore, and burned them in crude kilns, producing a lime about 30 per cent pure. This was used for building purposes and was not very valuable.

The lime used for refining sugar has been and now is imported largely from Japan. This Japanese lime is shipped to the Visayan sugar regions in kerosene cans, and sells for about $27 per short ton. In some places an attempt has been made, by sugar men themselves, to produce lime locally. At the Roxas hacienda in Batangas, a few years ago, an attempt was made to produce refining lime from limestone deposits in the neighborhood, but the burning process was crude and the product mixed with ashes.

The Bureau of Science undertook to demonstrate that good lime could be produced from local limestone deposits, and to that end built a modern kiln, burning lime from pure stone. Local sugar men were induced to try the lime in refining sugar, and it was found to work very satisfactorily. From these experiments of the Bureau of Science considerable interest has been created, and several projects have been started for the production of lime locally.

SHIPPING, NAVIGATION, AND HARBOUR-WORKS IN JAPAN

As a country like Japan, which is surrounded on all sides by sea, must depend for the development of its domestic industries and advance of its foreign trade solely upon the development of its navigation, the Government had long made efforts to protect and encourage navigation, and at length in March, 1896, issued the Navigation Encouragement Law (Law No. 15, 1896), according to which Japanese subjects, or trading companies whose partners or shareholders are all Japanese subjects, engaging in traffic between Japan and a foreign country or between foreign ports, subject to certain conditions were granted a navigation subsidy. But this law was, by Law No. 15 entitled the Ocean Service Subvention Law, promulgated in March, 1909, abolished after the last day of December of the same year. Under the new law, Japanese subjects, or trading companies whose partners or shareholders are all Japanese subjects engaging in transportation business receive navigation subsidies according to mileage, tonnage, speed, and age in respect of steel steamships with a gross tonnage of not less than three thousand tons, a speed of not less than twelve knots, and not more than fifteen years old, which have been registered in the shipping register of the Empire. Such vessels may be made to run regularly, for a period of not more than five years, on the four ocean lines, namely, to Europe, North America, South America and Australia.

The principal steamship companies which at present enjoy Government protection under the law above-mentioned and otherwise are the Nippon Yusen Kaisha (Japan Mail Steamship Company), the Osaka Shosen Kaisha (Osaka Mercantile Steamship Company), the Toyo Kisen Kaisha (Oriental Steamship Company), the Nisshin Kisen Kaisha (Japan-China Steamship Company), and the Nanyo Yusen Kaisha (South Sea Mail Steamship Company), and these five companies run steamers on the following lines:—

Nippon Yusen Kaisha. Besides engaging in the domestic coasting-trade (including Taiwan and Karafuto services), it runs regular services on the European, North American, Australian, Bombay, Calcutta, Shanghai, Vladivostok, North China, and Tsingtau lines.

Osaka Shosen Kaisha. Besides engaging in the domestic coasting-trade, it runs regular services on the North American, Tsuruga-Vladivostok, Otaru-Vladivostok, Dairen, Tientsin, South China, Bombay, Chemulpo, Hongkong-Haifong, Tsingtau, and Antung lines.

Toyo Kisen Kaisha. It runs steamers on the South American, North American, and Hongkong lines.

Nisshin Kisen Kaisha. It is engaged in the navigation of the Shanghai-Hankow, Hankow-Ichang, Hankow - Hsiangt'an. Hankow-Changta, Lake-P'oyang, Shanghai-Soochow, Shanghai-Hangchow, Soochow-Hangchow, Chinking-Tsingkiangpu, and Chinkiang-Yangchow lines.

Nanyo Yusen Kaisha. It runs regular services on the Java line.

Japan's shipping has since 1893 shown a steady increase in the number of vessels; and at the close of 1903 the country possessed 657,000 tons of steamers and 322,000 tons of sailing vessels, making a total of 979,000 tons for both descriptions; the tonnage of the steamer fleet was then about four times what it was nine years previously at the outbreak of the war with China. Nevertheless, her stupendous struggle with Russia necessitated a still further increase; accordingly, foreign vessels were bought, chartered, or given special permission to engage in the coastwise trade. In the course of the year 1904, the losses connected with the blockade of Port Arthur and those due to other causes came up to 71,000 tons; but on the other hand, 27,000 tons of steamers were built in Japan and 117,000 tons were purchased from abroad, making a total of 204,000 tons. Thus, the net increase was 133,000 tons, and the steamer fleet rose from 657,000 tons at the close of 1903 to 790,000 tons twelve months later. At the end of 1914 the registered gross tonnage of steamers was increased to 1,577,025 tons and that of sailing vessels to 513,244 tons, making a total of 2,090,269 tons.

Turning next to the shipbuilding industry of Japan, we find that it had already made steady progress when the Shipbuilding Encouragement Law and the Shipbuilding Regulations came into operation in 1896; and the industry has since advanced with remarkable energy. Prior to the operation of that law, vessels exceeding a thousand tons were usually purchased from abroad. But since this time, under the law referred to, bounties have been granted for the construction of iron or steel vessels of not less than 700 gross tons by any Japanese subject or any commercial company whose partners or shareholders are all Japanese subjects, that is engaged in shipbuilding. In consideration of the necessity of the then circumstances and in view of the increase of Japan's naval strength and the progress of her shipbuilding art, the law was revised in March, 1909 so as to grant bounties only for the construction of steel vessels of not less than 1,000 gross tons and put in force on January 1st, 1910. The encouragement given by the Government in the matter has been so great that by the end of 1914 there were altogether 131 vessels of 700 gross tons and upward built in Japan, aggregating 428,832 tons. Under such circumstances Japan's shipbuilders have been successful in building big warships and large ocean liners which are fully qualified to run on many important foreign service lines, and they have, moreover, built vessels to foreign orders. By the end of 1914 there were altogether 244 private shipyards and 63 private dry docks in Japan.

With respect to harbour-works in Japan, after Yokohama and several other localities had been selected as open ports in the Ansei era (1854-59), they were fitted for use as commercial ports merely by taking advantage of their natural features in making suitable accommodation for the purpose; but with the progress of the nation its foreign trade annually increased to such a large volume that the existing accommodation became inadequate; and so its extension and improvement came to be planned after a careful consideration of the actual condition of the harbour.

At present Japan possesses thirty-seven open ports, but the bulk of its trade is carried on through the two harbours of Yokohama and Kobe. Yokohama celebrated in July, 1909 the jubilee of its opening to foreign trade, while Kobe is 48 years old. Their progress is an index of the striking development of the whole country. The principal harbour-works are the following:—

Yokohama Harbour.—The harbour is enclosed by two breakwaters, one in front of the harbour extending south-east to the length of over 5,380 ft. and the other extending north-east to the length of over 6,700 ft., leaving a harbour entrance 800 ft. wide and 33 ft. deep below the lowest spring tide. The breakwaters, together with training wall of 6,090 ft. built for the purpose of regulating the river streams, encompass within the harbour a safe anchorage of about 1,230 acres. The iron landing pier is 62½ ft. wide and over 1,800 ft. long, projecting in front of the Custom House. Coupled with these engineering works, various schemes for improvements were started both on land and sea, such as the construction of private docks, sheds, and warehouses.

The equipments in the old Customs compound were also improved, and the compound covers an area of 11 acres with 12 sheds covering an area of over 11,337 sq. yds. and 9 bonded warehouses of over 7,229 sq. yds. Along the shore, a number of cranes of 1 to 10 tons and rails extending over 5 miles are provided.

The foregoing accommodation having been judged inadequate to meet the requirements of the rapidly-developing trade of this harbour, the Government again started in 1899 reclamation work and proceeded to provide quay accommodation for the mooring of a larger number of vessels, and to build more sheds and warehouses and make direct connections with the main railway lines of the Empire. In 1912, improvement work on the present pier has been entered upon.

The reclaimed ground covers an area of about 56 acres, surrounded with quay-walls and landing-stages. The effective length of the quay-walls is 5,673 ft., and the depth is from 20 ft. to 32 ft. below the lowest spring tide. The sheds in the reclaimed ground are 14 in number, covering an area of 50,308 sq. yds., and the warehouses are three-storied and 2 in number, covering 7,621 sq. yds. The rails laid are 9 miles long. 18 sets of 1.5—5 ton electric travelling cranes, and 1 set of 50 ton electric stationary crane, equipping the quay-walls, are operated through the generating-house built on the reclaimed ground. By improving the present pier, its width will be increased to 138 ft., and the water-depth of 35 ft. at the lowest spring tide will be made along either side; two two-storied sheds each covering 2,174 sq. yds. are to be constructed on the pier, the upper story being furnished for passengers' use, and the lower floor for cargoes; and the pier will be able to have two large steamers moored on each of its sides.

The whole of the reclamation work was completed in 1910. The equipments on the reclaimed ground were finished in 1914, and the improvement of the pier will be completed in March 1917, the total amount of expenditures being estimated at yen 10,484,000 (£1,073,850).

The dredging work was begun in 1890 and already about 800 acres, or nearly two-thirds of the water-area, have been dredged to the depth of from 20 to 35 feet below the lowest spring tide. It is continually being carried on to increase the dredged area and the water depth from 24 to 35 feet.

All these works are, however, judged still inadequate to cope with the steady expansion of foreign trade in this harbour, and both the Government and the general public agree in urging the necessity of starting further improvements. The railway lines on the western and northern shores of the port have already been greatly extended, with more freight terminus accommodations, and the construction of quay-walls for coast-trading vessels, the extension of the shore-lines of the Yokohama Railway Company and the Yokohama Warehouses Company, the reclamation of the foreshore outside the harbour which will be used for the sites of various factories, and the opening of a canal between Tokyo and Yokohama will be undertaken in course of time.

Kobe Harbour. The harbour is really an ideal one with many topographical advantages; but provided only with lighters' wharves, it absolutely lacked the modern equipments of a trade port in keeping with its commercial development. The Custom-house equipment in 1901 consisted of only 8 warehouses with an area of 2,911 square yards, 14 sheds with an area of 18,197 square yards, and 9 cranes ranging from 5 to 30 tons. In 1902, the Government constructed two small breakwaters in front of Onohama and the Imperial Government Railways built a branch line to connect with the harbour; but these were chiefly for the cenvenience of the lighters. It was not until 1906 that plans were made for the construction of jetties and piers in the same harbour as a six-years' continued undertaking for the convenience of ocean steamers, and as accessory undertakings, several sheds and small piers were built at the Kawasaki wharf.

But as these works were mere makeshifts and inadequate for coping with the development of the trade of the port, new plans were made and works were commenced as undertakings to be completed in eleven years from 1907 for foreshore reclamation and land accommodation.

The new reclamation area will be 67.8 acres and there will be four moles whose quay walls will have a total effective length of 8,351 feet and a depth of from 30 to 36 feet at low tide. There will be also lighters' wharves, 1,787 feet long. Along the quays and wharves there will be 17 steel and two wooden sheds with a total area of 63,332 square yards. On the reclaimed land railway lines about twelve miles long will be built; and the quay will be fitted with 21 electric travelling cranes of from one to five tons and the wharves with five stationary hand cranes.

These works, which will cost yen 13,075,409 (£1,339,282), are expected to be completed in March, 1918.

The breakwaters which have been planned for the harbour by the Government will have a harbour-entrance 895 feet wide and 42 feet deep at low water and two side entrances; the total length of the breakwaters will be 15,211 feet, enclosing a water-area of 1,716 acres; and in 1910 the Government commenced the construction of a breakwater running 3,770 feet eastward from the side entrance above referred to in front of the Kawasaki Wharf, for the protection of the quay walls above mentioned; this breakwater will, it is believed, be completed in March, 1919 and cost yen 2,670,000 (£273,482).

About the same time as these equipments made by the Government, the Tokyo Warehouses Company began the construction of similar works at Wada and Takahama: at Wada the works begun in 1908 were an iron pier 600 feet long, 62 feet wide, and standing in water 26 feet deep at low tide, sea-walls on both sides of it with a total length of 1,842 feet, and sheds with a capacity of 26,722 square yards and warehouses with a capacity of 1,932 square yards, and 16 1½-ton cranes, and a railway of more than four miles; and at Takahama 13 acres were reclaimed, quay walls 1,704 feet long and with 27 feet of water, sheds of 17,491 square yards capacity and warehouses of 17,664 square yards and railway lines four and a half miles long, were constructed.

The private equipments in connection with the foreign trade of the port are, in addition to the above, the warehouses and sheds, aggregating 27,816 square yards, of the Kobe Pier Company at Onohama, and the warehouses and sheds of 13,248 square yards capacity of the Toshin Warehouses Company at Onohama and Higashide-machi. The latter Company has undertaken to reclaim about 8 acres in front of Onohama to construct a quay wall 1,020 ft. long and 30 ft. deep and to make necessary accommodations thereon.

TIN MINING AND SMELTING IN THE ORIENT

In reviewing the tin production of the world for the past few years, a report of the United States Department of Commerce gives the following particulars regarding the tin deposits of Federated Malay States and China, the latter country being the third in point of production.

The greatest tin-producing region in the world is in the Federated Malay States, a colony of the British Empire, which comprises the four Federated States of Perak, Selangor, Negri Sembilan, and Pahang, and the three native States of Kedah, Kelantan, and Trengganu, in the Malay Peninsula. These States have a total area of nearly 43,000 square miles. The Department of Commerce monograph by D. C. Alexander, Jr., on Mining in the Federated Malay States, contains some facts concerning the tin mining which may here be set down.

The tin is usually found in the form of cassiterite, an impure stannic oxide (SnO_2), and was undoubtedly originally deposited in the metamorphic granite of the mountains and hills of this region. Lodes of the ore are found in many places in the granite in the form of an onyx quartz, and the working of this quartz has been frequently undertaken. However, the quartz workings have seldom been successful, since the profit derived from them compares very unfavorably with what can be earned from even the low-grade alluvial deposits. It is generally held by mining engineers of this district that quartz workings will not become numerous or profitable until all but the very lowest grades of alluvial deposits have been exhausted, which will probably not be for another 25 or 30 years. Moreover, should large alluvial deposits of tin ore be found in the recently acquired Provinces of Kedah, Kelantan, and Trengganu, where prospectors are at work, the day of the quartz working will be further postponed.

On the other hand, there are a few quartz deposits so rich that thoroughly experienced miners have not hesitated to erect the expensive mills necessary for working them. One such plant is that of the Menglembu Lode Syndicate, near Ipoh. Another mill was erected recently near Bentong, Pahang. Moreover, the Government of the Federated Malay States agreed several years ago to a proposal of the Mine Owners' Association that reductions of not more than 50 per cent of the export duty on tin and tin ore should be granted to miners able to show that the properties which they are working are of so low a grade that a reasonable profit can not be earned if the full duty is exacted. This measure was expected to have the effect of encouraging quartz mining.

The alluvial deposits of tin ore are very widely scattered, but the richest are usually found lying close to the slopes of hills or mountains, narrow valleys being most productive. This is easily explained on the theory that the disintegrated granite which contains the tin was washed down the slopes by rains and streams, and the tin ore, because of its weight, remained in pockets close under the slopes, while the sand that accompanied it was carried to a greater distance. That the streams in the valleys carried away the granitic sand and continuously deposited silt is shown by the fact that the richest ore is found in beds of clay.

The famous and wonderfully rich Kinta Valley of Perak is an excellent example of the formation described. The valley is about 30 miles long, with an average width of 5 to 6 miles, and the hills on either side rise to an elevation of 300 to 400 feet. On the west side of the valley the granite of the hills slopes down until it meets the limestone floor, while on the east side of the valley the hills are flanked by cliffs of limestone outcrop. The Kinta, Sorakai, and several smaller streams flow through the valley. The richest ore deposits lie on the west side of the valley; but the east slope has what the west slope lacks—an abundant supply of water, by means of which the lower grades of ore can be profitably worked.

Smelting Plants in Straits Settlements—The Export Duty

The two plants that smelt most of the tin ore produced in the Federated Malay States are situated in Straits Settlements. It is said that over 80 per cent of the tin ore exported is smelted either in the smelter of the Straits Trading Co., at Singapore, or that of the Eastern Smelting Co., at Penang; these smelters also receive a small amount of ore from Australia and South Africa. Such of the Federated Malay States ore as is not smelted in the Straits Settlements goes to England, the following provision of the customs tariff making it impossible to ship the ore to other countries for smelting:

Export duty, tin ore, 70 per cent of the duty on tin, with, in the case of tin ore exported otherwise than under such guaranties as the Resident may require, that it shall be smelted in the Straits Settlements or United Kingdom, an additional duty of Straits $30 per picul ($285 United States currency per long ton).

The export duty on block tin, provided by the same tariff, is Straits $10 per bhara (400 pounds) when the price of tin does not exceed Straits $41 per picul; but when the price exceeds $41 per picul the duty per bhara is increased by $0.50 for every $1 by which the price of tin exceeds $41 per picul.

Exports During Recent Years

Accoring to a report submitted by American Vice Consul Caspar L. Dreier, at Singapore, the total export of tin from the Federated Malay States during 1914 amounted to 49,042 tons, as compared with 50,128 tons in the previous year and 48,250 tons in 1912. The war, this report states, had the effect of restricting somewhat the output of tin. The total decrease, compared with the preceding year, is given as 18,220 piculs (1 picul=133⅓ pounds), the decrease in value being $2,048,621 United States currency. Perak, as the largest producer, shows the largest decrease, this being 14,215 piculs, with a decrease in value of $1,225,820. The total output of tin during 1913 was 842,129 piculs, and during 1914, 823,909 piculs.

China is Third in Production.

Annual reports for 1914, give the exports of tin in slabs from the whole of China (excluding Hongkong, a British possession) during that year as 7,948 tons, of a value of $5,578,992, as compared with 9,245 tons, of a value of $8,094,886, during 1913. In 1914 there were no exports of tin to the United States from the ports of China other than Hongkong, and in 1913 such exports amounted to only $5,288.

China ranks next to the Federated Malay States and Bolivia in the production of tin. Nearly all the supply is brought from Yunnan to Hongkong, where it is refined and shipped to Europe and America or distributed to the Chinese market. The output of Yunnan is now hampered by limited water supply, difficulty of transport, and the high cost of fuel and food.

German interests have constructed a tin-refining plant at Ko-Chiu to turn out 50 tons of standard tin per day by coal-gas furnaces. It has never been fully worked, as all the coal has to be transported from Pi-Chi-Chai by mules, but as soon as the branch line is built coal will be plentiful, and if water can be had the output will probably exceed 50 tons per day, as at present (1913) without a refinery the output is over 30 tons per day from the native smelters, which turn out tin averaging 84 per cent pure, to be shipped to Hongkong for refining in native furnaces. Tin is found from the east side of the range, about 8 miles from Meng-tze, to the western bank of the Red River, an area 24 miles wide by about 56 miles long.

During 1913 the output of tin from the Yunnan mines was placed by the trade at about 14,000 tons, as compared with about 10,000 tons in 1912.

New tin mines in South China are to be developed in the new British territory, the Kowloon extension, according to Vice-Consul General A. E. Carleton, of Hongkong. Some 40 shafts have been sunk, and tin has been obtained from every one of them in quantities, it is claimed, that leaves no doubt of the remunerative nature of the enterprise; in fact, a Straits company is prepared to take any quantity of the unsmelted ore at about $735 per ton. It is proposed to operate the tin-bearing soil by dredges.

Exports from Hongkong

In 1914 Hongkong exported to the United States tin slabs to the value of $769,538, as compared with $1,632,213 in the preceding year, according to a report submitted by Consul General Anderson. The values of the 1911 and 1912 tin exports to this country were $798,941 and $1,404,115, respectively. The exports previous to 1911 were too small to merit separate enumeration in the returns.

Consul General Anderson says that exports of tin from Hongkong to all parts of the world fell off about one-third during 1914, as compared with the preceding year. The figures of the Hongkong General Chamber of Commerce indicate that the shipments of tin in slabs of 112 pounds each during the three most recent years for which statistics are available have been as follows:

Destination.	1912 *Slabs.*	1913 *Slabs.*	1914 *Slabs.*
United	27,551	36,790	24,699
Great Britain	24,752	8,047	5,644
Continental Europe	63,772	32,575	20,895
Total exports	116,075	77,412	51,238

It should be stated that these figures are to a certain extent misleading, in that a large portion of the tin consigned to Europe is consigned with the option of New York and is diverted to the United States while en route to Europe. These exports are credited to Europe but are really destined for the United States in the first place.

In China itself, Consul General Anderson reports, there is a decrease in the use of tin for ceremonial purposes that is reflected in the decreasing imports, while the increased sale of Chinese tin abroad, due to widening sales connections and increased demand, is more than taking up the large increase in production. The tin refined in Hongkong is almost entirely from the mines in Yunnan and Kwangsi Provinces in China. The refining business in Hongkong is controlled by a few firms who operate in connection with a combination of buyers working with Government interests in Yunnan in a way practically to control the output. The tin situation in Hongkong, Mr. Anderson says, can be controlled by these interests at any time, but export prices are fixed, of course, upon the basis of the world's markets.

Dutch East Indies—Australia—Other Countries

In the Dutch East Indies there are important tin deposits, chiefly on the islands of Banca and Billiton. Consul B. S. Rairden, at Batavia, Java, reports that the production of the Banca tin mines in 1914 amounted to 225,284 piculs (about 15,319 short tons). During the preceding year there were sold at public tender in Batavia 66,000 slabs of tin, each weighing 74.8 pounds, totaling 4,938,800 pounds, at an average of $0.4261 per pound.

Australia in 1914 exported $1,334,939 worth of tin, as compared with $3,262,594 in 1913. Some of the chief tin mines are in Queensland and the production in that State in some representative years since 1881 has been as follows: 1881, 3,456 tons; 1891, 2,236 tons; 1901, 1,661 tons; 1906, 4,823 tons; 1907, 5,140 tons; 1908, 4,825 tons; 1909, 3,326 tons; 1910, 2,953 tons; 1911, 3,091 tons; 1912, 3,230 tons; 1913, 3,197 tons.

In addition to the countries previously discussed, tin is found in Japan, Korea, Siam and British Burma but the production is comparatively insignificant.

CHINA'S LEATHER IMPORTS

The importation of leather and leather manufactures into China has steadily increased in recent years. Among the reasons for this were the purchases of new equipment for China's army, including boots, shoes, belts, etc.; the establishment of cotton, silk, and flour mills, which has created a demand for belting; and the adoption of the Western style of dress by many of the Chinese, with incidental purchases of shoes, trunks, bags, and other articles. Although a few tanneries have been established in the coast and principal cities, and, to some extent, in the interior (one of some importance in Szechwan Province), they have not been, thus far, very successfully operated. Various causes are responsible for this condition, poor business management and a lack of proper technical knowledge of the trade being predominant. There are indications that China will continue to have a great part of its leather needs supplied from abroad for some time.

The net imports of leather, and belting and leather manufactures into China for the years 1911-1914 were.

Articles	1911 $	1912 $	1913 $	1914 $
Leather	2,849,004	4,585,785	5,323,170	4,174,142
Manufactures	277,466	280,686	271,773	224,939
Belting	105,999	118,090	191,550	194,011
Total	3,232,469	4,984,561	5,786,493	4,593,092

The percentages of imports from various sources for 1913 and 1914 were:

Articles and sources	1913 *Per cent*	1914 *Per cent*
Leather:		
Hongkong	83.07	84.07
Japan	8.83	9.03
United States	1.67	1.17
Russia	1.48	2.08
Belgium	.88	.46
United Kingdom	.55	.55
Germany	.52	.45
Other countries	3.00	2.19
Leather manufactures:		
Japan	44.27	44.28
Hongkong	23.33	22.73
United Kingdom	12.50	12.23
Russia	11.73	15.34
United States	1.22	.93
Austria	1.65	2.37
Other countries	5.30	2.12
Machine belting:		
United Kingdom	51.93	50.51
Japan	21.62	19.91
Germany	11.62	10.70
Hongkong	4.41	5.60
United States	2.98	4.50
Russia	3.29	5.63
France	3.21	.14
Belgium	.34	2.63
Other countries	.60	.38

A large proportion of the leather imported into China is transshipped at Hongkong, and it is therefore impossible to ascertain its origin from the Chinese maritime customs statistics. Undoubtedly the greater part of it comes from Singapore, and the remainder from various European countries. Japan's share of the trade is also very large, particularly in leather manufactures. Its proximity to China, the low cost of production, and the opportunity for prompt deliveries are largely responsible for this condition.

The imports of leather and articles of leather manufacture into Shanghai, for 1914, were: Calf, kid and colored, $76,861; cow, American and European, $2,433; cow, Hongkong and Straits Settlements, $220,151; cow, Japanese, $53; enameled, japanned, and patent, $10,273; harness, $28,517; sole, $61,900; others, $13,390; chamois, $1,420; total value, $414,998.

There has been considerable trade in boots and shoes. China imported, in 1914, 227,174 pairs, valued at $392,819. Of this amount 65.8 per cent came from Russia, 11.21 per cent from Japan, 7.55 per cent from the United Kingdom, 7.46 per cent from the United States, and 4.2 per cent from Hongkong.

Three tanneries are established in Shanghai, operating with but moderate success. The principal one is controlled and operated under foreign supervision; the others are managed and capitalized by Chinese and Japanese, respectively. The manager of the foreign-controlled tannery frankly admits that it has not had a successful year, chiefly on account of the difficulty of obtaining tanning extracts, which heretofore had been mostly supplied from France and Italy.

There is little demand for harness leather. This was supplied before the war largely by Great Britain, at $0.48, United States currency, per pound. It is claimed that American harness leather is not suitable for use here, being too hard.

Shipments from United States Curtailed

Some years ago American leather was largely shipped into China, but the Japanese gradually displaced it to a large extent, though it is claimed that a fair percentage of the leather which Japan sends here was originally exported from the United States. This particularly applies to leather of superior quality. It is understood that shipments of American leather to China have been curtailed through the following causes: (1) The lack of representatives in this market; (2) not sending samples, which the Chinese invariably demand; and (3) the high price of American leather.

There is at present an opportunity for American leather manufacturers to canvass this market, chiefly on account of the elimination of certain supplies from Europe. The lack of shipping facilities and advanced tonnage rates are troublesome obstacles to be overcome.

THE NORTH CHINA DESK HONG LIST

The North China Desk Hong List for 1916 which has just been issued from the Press of the North China Daily News and Herald, Shanghai, has continued to improve in the 1916 edition as in former years, by a more comprehensive covering of its territory and the inclusion of many hundreds of names that might have been overlooked in less accurate canvasses. Beside the business lists of Shanghai, Hankow, Tientsin, Peking and all the outports of the coast and in the Yangtsze Valley, the Hong List has also gone over into Manchuria to compile lists from Antung, Changchun, Harbin and other cities. Aside from its service to the business man, a feature of the Shanghai section of the directory is a list of residences according to streets and the alphabetical residential directory instituted last year. The practice of listing Railroads in a separate section with names of their officers, has been followed again this year and is a great convenience.

The directory of missionaries has been further subdivided according to religious groups, Protestant missions and Roman Catholic missions being segregated, and the list has been much enlarged by the inclusion of the many small mission centres which had been overlooked in previous issues. Taken as a whole and in connection with its lists of residences in the out-ports, the 1916 Hong List furnishes a speedy method of locating any foreigner even though the address be so vague as merely China.

ENGINEERING, FINANCIAL AND INDUSTRIAL NEWS

RAILWAYS

The Canton-Hankow Railway.—Construction work on the Canton-Hankow railway has continued despite the war, though the great conflict will cause a suspension of activity before long owing to the exhaustion of finances. It will be impossible to push on to completion the section from Wuchang to the border of Kwangtung province, where it is to join with the section being constructed from Canton northwards, but connexion will at all events be made between Wuchang and Changsha, the capital of Hunan Province, a distance of some 225 miles. This link is expected to be forged by the end of this year at latest, with the exception of a few bridges where ferries will have to be used. Bridging is going to prove difficult even under most favourable conditions of finance and purchase of materials, the rise of water from navigable low water to flood height being some forty feet, and thus necessitating extremely high structures.

Already thirty-five miles of rails have been laid south from Wuchang (or Hsu-chia-pang, where the workshops are on the Yangtsze, five miles from Wuchang) and construction trains will shortly operate until a regular service can be introduced. By the end of March it is expected that 52 miles of line will be completed.

Peking-Jehol Railway.—As the Peking-Jehol line is important strategically to link up railway communication between the interior of China and Mongolia the Government according to Chinese press reports, has despatched engineers to make a complete survey of the line, whose estimated cost is approximately $12,000,000. The programme of construction is as follows:—The work to start not later than in June, 1916; the whole line to be completed in three years. The line is to be divided into three sections—(1) from Peking via Shunyi to Miyun, (2) from Miyun to Kupeikou, (3) from Kupeikou via Luanping to Jehol. The construction cost is to be defrayed from the surplus funds of the Peking-Mukden and the Peking-Hankow railways, in three yearly instalments, viz: $4,000,000 for the first, $3,000,000 for the second, and $5,000,000 for the third year.

Mr. Chang Pei-chun, of the Communications Ministry, Peking, accompanied by Mr. Ying-jui, of the Board for Mongolian and Thibetan Affairs, and a number of railway engineers, visited Mukden early in March. After consulting with the Mukden Government authorities, they started northward to survey the proposed route via Jehol and Chihfeng.

Hangchow-Hweichow Project.—Efforts are again being made to revive the project to build the extension from Hangchow to Kuangteh and Hweichow in Anhui Province which has already been surveyed. The Chekiang and Anhui promoters of the line, according to the *North-China Daily News*, have appointed a representative to talk the matter over with the Shanghai-Hangchow-Nanking Railway officials. When this railway is built, it will bring Mokanshan summer resort within a few hours of Shanghai and may pass near enough to the Shanghai Municipal Pingchiao quarry to transport the stone to Hangchow and Shanghai. Attempts will be made to induce the Government to hasten the building of this line.

Chefoo-Weihsien Railway.—Telegraphic advices from Tsinan say that arrangements have been made for raising the capital required for the construction of a railway between Chefoo and Weihsien and that work will be started in May, according to an announcement made by the Chinese. The cost of the line has been estimated at $10,000,000. Recently, the ministry has advised the Chefoo chamber of commerce that of the estimated cost, $1,000,000 shall be borne by the general chamber of commerce in Chefoo, $1,000,000 by the proposed railway, $2,000,000 by the province of Shantung, $2,800,000 by other provinces, totalling $6,000,000. The remainder of $3,200,000 will be financed by the ministry of communications.

New Amur Railway Facilities.—The Transbaikal railway authorities announce the running of one through train over the new Amur Railway through Blagovestchensk direct to Haborovsk from May 1. Passengers will be able to reach Vladivostok from towns in Russia without having to pass through Manchuria. The putting together of the new 30-ton American freight cars is progressing satisfactorily in Vladivostok so that the car famine soon will be over.

Kaifeng-Honan Line.—Railway construction westward is proceeding apace. Old bridges are replaced. In a short time trains will run both day and night between Hsuchow and Kuanint'ang west of Mienchi. This is a 35 stage run. Beyond Kuanint'ang are the long tunnels, and it will be two years before trains can go further. At present travellers stop at Kaifeng over night, but in a short time the train will go through direct. The limited supply of rolling stock now available is taxed to its utmost. The trains are so packed that often sitting room is out of the question, even the platforms between the carriages being thronged. The train passes by intermediate stations as there is no further room for the accommodation of travellers.

Broad Gauge in Japan.—A Japanese news agency states that the sum necessary to rebuild the railway as a broad gauge between Tokio and Shimonoseki is Yen 254,000,000 while the estimate for the repairs of the line is Yen 238,000,000. Therefore the Imperial Board of Railways of Japan has decided to effect the rebuilding of the line as a broad gauge railway and is waiting only the sanction of the government.

Yokohama Elevated Progresses.—Construction work on the elevated line of the government railway between Yokohama and Sakuragi-cho stations, which was started immediately after the new year, has been making rapid progress. The concrete foundation work for three bridges is nearly completed. The old Yokohama station will be reconstructed for the new line.

S. M. R. Traffic Returns.—The South Manchuria Railway Traffic Returns for February totalled Y1,915,304.89, a daily average of Y66,045, being a decrease of Y635,002.62 for the whole month and Y25,037.41 per day, as compared with February 1915. The total Traffic Receipts of the fiscal year to February 29th amounted to Y22,248,345.27, and the net increase over the corresponding term of the preceding fiscal year increased to Y532,409.07.

Federated Malay States Railways.—The extension of the Federated Malay States railway system towards Bangkok, has resulted in the opening of traffic from Prai to Alor Star a distance of 56 miles 18 chains. The position of the rail head now is the 84th mile and the earthwork is completed up to the 90th mile. A further extension of the railway it is expected will be open to traffic in January 1917 to Aro Station at the 80th mile. It is estimated that the F. M. S. section of the Bangkok extension will be completed about the middle of 1917, the distance to boundary station of Siam being 98 miles. The staking out of the Siamese section, Ootapao to Perlis boundary, was completed some months ago in continuation of the F.M.S. section, Alor Star to Perlis-Siamese boundary, and it is understood good progress has been made with the construction throughout. The junction station on the boundary is at Padang Besar, and it is anticipated that through communication between Prai and Bangkok will be established for passenger and goods traffic some time in the latter half of 1917. The passenger and goods traffic to and from Prai and Alor Star has come up to the Railway authorities' anticipations for the period during which the line has been open and the train service will have to be increased as soon as additional locomotives and carriages are obtainable from home. The new line is paying remarkably well, not only 3rd class carriages being fully taken advantage of, but the 1st class also often are full.

It has been decided that the extensions at Prai should be left to the F.M.S. Railways, as the government was unable to finance them sufficiently to make Prai a successful port. The remodelling of Prai passenger station is well in hand, and the doubling of the line from Bukit Mertajam to Prai completed. Plans for remodelling the goods yard and extending the wharfage accommodation have been submitted to the Consulting Engineers in London, and their report is now under consideration. It is hoped to provide wharfage for ocean-going traffic as the future of Penang is largely bound up in the proper development of Prai and the neighbouring foreshore, which should eventually become to Penang in a smaller way what Kowloon has become to Hongkong. Prai cannot help becoming an important centre of trade as the Peninsula develops, and the more facilities provided for the economical handling of a large trade the greater the gain of the port will be.

Philippine Railroad Project.—The Philippine Legislature has conferred a franchise for the construction of a railroad in the island of Negros, to do a general transportation business, but more particularly to improve the facilities for handling the sugar output of this the most important cane-growing district in the islands; and incorporation papers have now been taken out for a company to undertake the construction of the road. The incorporators are all Filipinos, the first project of the kind in which this has been the case.

The name of the company is the "Ferrocarril Agricola Pulupangdan-Isabela;" that is, the Pulupangdan & Isabela Agricultural Railway Co. The line is to run between these two places, the former of which is on the seacoast and is a somewhat important point for shipping sugar to Iloilo, while the latter is the center of one of the richest sugar-producing districts of the Province of Occidental Negros. They are about 40 miles apart.

The road is to pass through the towns of La Carlota, La Rama, Zaragoza, La Granja, Danao, and Castellana, all of which, and especially La Carlota and La Granja, are of importance for their sugar product; and authority has been secured to construct such feeder lines as may be necessary. The district thus tapped has an estimated population of 110,000, and it is computed that it should at present yield 70,000 tons of freight a year, and probably more as the sugar acreage is extended.

The company is also authorized to operate boats for handling sugar shipments from any port in Negros to Iloilo, which, though not on the island of Negros, is a port of entry and the center of the Negros sugar trade.

The authorized capital of the new company is 500,000 pesos ($250,000), divided into 2,500 shares of 200 pesos, ($100 each). Of this amount 20 per cent has already been subscribed by the incorporators, and 25,000 pesos ($12,500), or 5 per cent, has been paid up. The head offices will be for the present in Iloilo.

SHIPPING

New U. S. Ship Line to Orient.—A telegram from New York has been received at Shanghai to the effect that a new steamship company has been organized with a capital of $5,000,000, U.S. Currency. Fourteen ships have been purchased and it is the intention of the new company to operate on both the Atlantic and Pacific Oceans. These ships will fly the American flag.

New Dollar Steamer Strathardle.—Capt. Robert Dollar, Head of the Dollar Steamship Co., has just purchased the British steamer Strathardle from Messrs. Burrel and Sons, Glasgow, and will bring the vessel out to Shanghai shortly to operate a trans-Pacific service between Vancouver and the Orient. The Strathardle is of 2,829 tons net and was built in Dumbarton in 1910.

The above vessel will be successor to the Company's Robert Dollar, 5,356 tons gross, which, according to a report, has recently been sold, (the new Japanese owner says, for Y.280,000; actual sale price is stated in Shanghai shipping circles at Gold $1,000,000) for delivery in April next at Vladivostok.

T. K. K. Plans Big Ships.—Directors of the Toyo Kisen Kaisha have voted $18,550,000 for a shipbuilding yard and seven new transpacific steamers, of which two will be the largest and finest passenger ships on the Pacific, having a displacement of 25,000 tons each and a passenger capacity of 1,000. They will be of the *Manchuria* and *Mongolia* type, recently sold by the Pacific Mail Co., and will run from Japan via Hongkong to San Francisco. The company's new shipyard will build all of the steamers and will be located either at Yokohama or at Shimonoseki. The five smaller steamers will be of 10,000 tons each and will operate in the San Francisco, South American, Orient trade of the company. Bonds for the entire enterprise will be issued in Japan.

The difficulty that confronted this company for a long time was the payment of its debt. The amount of debt of the company was 7,630,000 yen in all last year, and of this 1,750,000 has been paid. It is quite possible that 2,000,000 yen or 2,500,000 yen of debt will be redeemed within the next six months and practically all of the debt will be cleared off at the end of this year. If these expectations are realized the company will have property valued at 40,000,000 yen, with a paid up capital of only 9,750,000 yen, the prospect of a fair profit and no debt.

Refloating the P. & O. Nile.—The Mitsu Bishi Dockyard is engaged in recovering Y.3,000,000 from the sea in the shape of the P. & O. S. Nile which sank off Iwaijima, Suho province, in the Inland Sea. The water at this spot is 30 fathoms. Mr. Yamashina Reizo bought the ship, as she lay, for Y.9,000. He succeeded in recovering about 800 bales of Shanghai cotton and sold the steamer to the Mitsu Bishi Dockyard for Y.13,000. The Dockyard is said to have expended Y.350,000 on preliminaries to the work, but expected to make Y.3,000,000 at the present high prices of steamers. Several ship owners and brokers are bidding for the vessel, offering up to 1,600,000 yen. The company is working hard day and night with twenty-five salvage vessels to refloat the sunken vessel.

Japanese Tramp Steamers.—The latest statistics give the number of Japanese tramp steamers as 238 with aggregate gross tonnage of 559,537, including 94 of 257,542 tons engaged in ocean-going services as follows:—

	No.	Tons
Chartered to Japanese............	50	147,322
,, ,, Foreigners.........	36	125,564
Employed on Shipowners' account............................	8	24,556

Japan's New Shipbuilding Yard.—It is reported that the shipbuilding yard promoted by Mr. Soichiro Asano and other business men is to be established in the compound of the Yokohama Dockyard Company as a joint undertaking between the dockyard company and Mr. Asano and others. Of the capital of the proposed undertaking which is fixed at 4,000,000 yen some 70 per cent will be taken by Mr. Asano and other business men and 30 per cent by the Yokohama Dockyard Company.

Formosa South Sea Line.—The Osaka Shosen Kaisha will open a new line to the South Sea Islands, starting from Keelung, Formosa. They will receive a subsidy of 100,000 yen from the Formosan government. Two vessels, the Kim Maru, 3,284 tons, and the Neshu Maru, 3,376 tons, are selected for service on the new line. The first vessel will leave Keelung April 1 and after calling at Amoy, Swatow, Hongkong, Singapore, Java, Celebes, Borneo and Manila will return to Keelung.

Japan Sells Russia Warships.—The Japanese papers now say that the three Japanese warships Tamba, Soya and Sagami, which were reported to have been sold to the Russian government, will be delivered to the Russian navy at Vladivostok some time toward the end of this month. These vessels were captured in the Russo-Japanese war and the sale price is said to be upwards of 10,000,000 yen.

Philippine Owners Selling Ships.—Although the attorney general has ruled, in a dicision, that local shipowners are liable to a fine of not more than P25,000 for selling, leasing, or otherwise disposing of vessels owned by them and operated in the interisland trade, when such sale, lease, or disposal will deprive the people here of their services as common carriers, the government has no intention of initiating prosecutions. Six large steamers already have been taken from the Island runs.

Dutch Liners to Philippines.—Because of the great demand for freight space out of Manila, the Java Pacific Lyn has ordered another steamer to call at Manila. The Tjimanoek will arrive about the first of April and will be dispatched for San Francisco via Hongkong and Nagasaki about the fourth.

TRADE AND COMMERCE

India's Wheat Exports Decrease.—Exports of wheat from India show a decided falling off for the second time in two years from the crop of 1913-14, and the probability is that the 1915-16 output for the overseas trade will be less than 700,000 tons. Last year the complete figures showed exports of 705,000 tons, a decrease of 500,000 tons from the year before. Up to January, exports of the present crop were only 650,000 tons and as the bulk of the crop already had been shipped at the end of September, the last few months have shown negligible quantities exported, indicating that the market has been swept bare. The banner year for Indian wheat was 1912-13 when 1,660,000 tons were shipped. The bulk of this year's crop went to Great Britain including 533,400 tons valued at R 68,900,000 bought by the Government.

India's Crop Forecasts.—The following is a summary of the various crop forecasts relating to the season 1915-16 issued by the Department of Statistics, India, and published in the *Indian Trade Journal* on the dates mentioned in the last column:—

Crop.	Estimated Area.	Per cent of preceding year.	Estimated outturn.	Date of publication
	Acres			
Sugar-cane.	2,375,000	103	2,636,000 tons.	March 3, 1916
Sesamum.	5,185,000	94	480,000 tons.	Jan 28, 1916
Cotton.	17,967,000	73	3.819,000 bales	March 3, 1916.
Indigo.	314,300	212	39,900 cwts.	Dec. 31, 1915.
Rice.	76,792,000	100	32,877,000 tons.	March 3, 1916.
Groundnut.	1,935,000	80	1,011,000 tons.	Feby. 25, 1916.
Wheat	28,244,000	88	...	Jan. 7, 1916.
Rape and Mustard.	3,560,400	55	...	Jan. 7, 1916.
Linseed.	2,705,700	81	...	Jan. 7, 1916.

London Hemp Market.—At the auctions held in London on January 26, Indian hemps received by far the most attention. Demand was brisk for these, and the market ruled strong with high prices realised, while in the case of Manila grades practically the whole of the offerings were withdrawn, but where business resulted steady prices were paid. Of 2,893 bales of East Indians offered 1,450 bales sold, and fine dressed changed hands on the basis of £48 to £49, while of 1,205 bales of Manila offered only eight bales were disposed of.

France's Silk Production.—The following figures, published in the *Journal Officiel*, show a notable decrease in the production of raw silk in France since the out-break of the war:—

	1913.	1914.	1915.
Total number of silkworm rearers	90,517	83,825	43,327
Quantity of "seed" (eggs) incubated, in ounces of 25 grams each .	125,678	108,943	49,182
Production of cocoons (unstoved) in kilogrammes	4,423,046	5,067,392	1,727,326
Value in francs	15,655,016	19,908,930	4,243,027

It must be observed that the French silk harvest of 1914 was completed at least a month before war was declared.

Calcutta's Hide Exports.—The statement below shows the quantity (pieces) of raw cow-hides exported from Calcutta to the United Kingdom, the Continent, and America from 1912 to 1915:—

	To United Kingdom.	To Continent.	To America.	Total Hides.
1915	408,603	4,192,949	1,322,216	5,923,768
1914	154,211	5,676,395	343,096	6,173,702
1913	17,530	6,981,947	261,060	7,260,537
1912	39,583	7,812,626	801,221	8,653,430

The sales effected by public auction at London during 1915 have been 50,584 hides, against 1,075 in 1914 and *nil* in 1913.—*Indian Trade Journal.*

World's Rubber Yield.—The following estimate of the world's production and distribution of rubber (in tons) during 1915, pending the receipt of further official figures, as published in the *World's Rubber Position*:—

Production:—Plantation, 106,136; Brazilian, 37,220; Rest (including Central American, African and Mexican), 16,625; a total of 159,981 tons.

Distribution:—America, 97,000; United Kingdom, 17,981; Russia, 13,000; France, 11,000; Italy etc., 7,000; Canada, 3,600; Japan and Australia, 2,000; Scandinavia, 2,400; Germany, Austria-Hungary, etc., 6,000. The world's production of rubber for 1916 is estimated at 194,000 tons—comprising of plantation 140,000, Brazil 37,000 and the rest (including Central American, African and Mexican) 17,000 tons—the percentage increase over last year being 21.2.

Siam's Trade for 1915.—According to a report by Mr. H. Fitzmaurice, the British Vice-Consul of Bangkok in the Board of Trade Journal, the outlook for trade with Siam is promising.

Exports of rice were very heavy, and this, following on the record year 1913-14, should, under normal circumstances, have re-acted favourably on the import trade. Owing, however, to the war in Europe, all anticipations were upset.

At the outbreak of the war there was naturally great nervousness as to the financial effect it might have, especially as it followed so closely on the local financial troubles experienced at the end of 1913 and beginning of 1914. For a time all confidence in the bazaar was shattered, and not only were importers afraid to deliver goods and take fresh orders, but a great many native buyers were disinclined to give new orders. The importers quickly realised, however, that to avoid catastrophe it was necessary to continue credit business, and this was generally done, with the result that confidence was restored fairly rapidly.

As indicated, orders and shipments were greatly curtailed for a time and imports of bazaar goods, more particularly cotton goods, suffered accordingly. Despite these reduced imports, however, at no time since the war started has there been anything approaching a shortage in stock of cotton goods.

This was no doubt due to the large stocks held both by European importers and in the bazaar when the war broke out. Until recently, dealers have shown an increasing tendency to order liberally, especially in piece-goods, but unless new crop prospects improve before long a dull market is likely to be experienced, and the bazaar may suffer in consequence. The colour difficulty (due to the shortage of supplies of aniline dyes) is likely to be of great importance, and there is increasing difficulty in securing many lines of coloured goods.

One result of the war will be to create healthier trade conditions than have been the rule for some years past. Enemy countries will no doubt make great efforts to regain lost trade, but it seems likely that they will not be financially capable after the war of extending credits in their former liberal manner.

It may be mentioned that many lines of British goods are at present only obtainable at very high prices, while all European goods are considerably affected by the high rates of freight now ruling, and both imports and exports at Bangkok will be bound to be adversely affected in consequence. The high prices that now have to be paid for most metals may also influence seriously the volume of imports in 1915-16.

FINANCE

Philippine Agricultural Bank.—As the recently enacted law which makes provision for establishment of a national bank contemplates absorption by that institution of the present agricultural bank, the affairs of the latter furnish a subject of more than passing interest. The following figures are of recent date and give a comprehensive idea in brief form of the status of the agricultural bank:—

Loans outstanding to date... ...	P5,240,710.00
Loans authorized to date and not yet paid	346,650.00
	P5,587,360.00
Average for last five years P7,347,300.00—50% allowed ...	P3,673,650.00
Capital	1,000,000.00
Net profit December 31, 1915 ...	869,269.73
48/90 of profit last quarter, P83,218.66	44,383.28
	P5,587,303.01

It is understood that applications for loans amounting to in the neighborhood of P1,000,000 have been passed on but not authorized, as there are no funds available to make them. The above figures show that on the date this statement was prepared loans amounting to P346,650 had been authorized but not actually made, for the reason, doubtless, that cash was not immediately available for the purpose. The average deposits are shown to amount to P7,347,000, of which 50% may be invested in real estate mortgages. In addition, the capital and profit accumulations are also available for the purpose. As the assets are to be taken over by the new institution, the regulations governing the national bank will naturally modify the provisions under which the agricultural bank has operated.

MINING

Japan's Foundry Enlarging.—The Japanese Government plan to enlarge the scope of the Steel Foundry in Kyushu with a fund of Y.87,000,000, the work to be spread over five consecutive years, has been sanctioned by the Diet. Mr. Kataoka, chairman of the Budget Committee of the House, announced that the committee had adopted the bill in its original form. Mr. Chuzo Mizuchi, of the Seiyukai, asked about the proceeds from the iron foundry after the proposed expansion. Mr. Kono, Minister of Agriculture and Commerce, said it would be about 5,000,000 yen annually. Mr. Shoichiro Yoshiuye, of the same party, said he had no objection to any expansion of the government foundry. He was however dissatisfied with the proposed expansion which he feared would fail to meet the increasing demands for iron in this country. Although the government foundry, according to the government's plan, would be able to produce iron materials of 600,000 tons annually when the proposed scheme is completed six years hence, yet the demands for iron would increase to more than 2,000,000 tons annually by that time. He asked why the government did not encourage individual capitalists to undertake iron foundry business at this opportune moment. He charged the government with having no fixed policy for this purpose; it was simply thinking how to increase the income of the Imperial Government Iron Foundry, even at the expense of private concerns.

Plan New Steel Works.—Another plan for the augmentation of steel supplies is reported to be afoot among the proprietors of the Kamaishi Iron Mine in Japan. The chief expert of the mine is collecting machinery for the extension of the old plant, in which the proprietors will place Y5,000,000 more. The addition will be built and in full operation by June.

The annual production of the mine when the whole plant is in operation is estimated at 120,000 tons of pig iron and 80,000 tons of steel.

F.M.S. Tin Exports.—The following is a statement of block tin ore exported, approximate value in Singapore, during the year 1915 compared with corresponding period of previous year.

	Block Tin.		Tin Ore (70 per cent. of gross weight)	
	1915	1914	1915	1914
	*piculs		piculs	
Total...	73,404	61,179	711,097	762,730

	Total Tin		Decrease
	1915	1914	
	piculs	piculs	piculs
Total ...	784,502	823,909	39,406

State	Singapore Value		Increase
	1915	1914	
Total	$61,318,593.27	$60,690,610.15	$627,983.12

*Piculs of 133⅓ pounds. Straits Dollar = 57 cents gold.

Manila May Reopen Quarry.—In order to look into the proposed project of reopening the city quarries at Talim Island, members of the municipal board made an inspection trip to the quarries formerly operated by the city. Member de los Reyes stated that the present contractor has already collected P204,000 for stone and that 62,000 cubic meters of this material was now piled up so that the city would not have to purchase stone for some years. It is estimated that P12,000 to P13,000 will be required to put the machines at the quarry in working order again, apart from the money necessary to put the boats for transportation purposes into service.

Seoul Mining Co.'s Report.—The following results were obtained by the Seoul Mining Co. from the Suan and Tul Mi Chung Mines operations for the month of February, 1916.—

Tons Crushed	14,420 tons.
Value Bullion Recovered.........	Yen 126,205.00
Value Concentrates Recovered.	115,963.00
Total Receipts (approx.)...	Yen 242,168.00
Operating Expenses (approx.)	110,000.00
Operating Earnings (approx.)	Yen 132,168.00

Many Mines in China.—According to an estimate it is said that there are at present no fewer than 4,049 mines which are now being operated throughout the country, covering a total area of 11,310,052 mou of land. There are said to be 7,561 "officers and engineers" and 122,459 common labourers employed in these mines.—*Peking Gazette.*